Information Technology and Indigenous Communities

Dedicated to Tony Boxall (1957–2012)

Information Technology and Indigenous Communities

Edited by
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Developed from papers presented at the 2009 AIATSIS National Indigenous Studies Conference and the 2010 symposium Information Technologies and Indigenous Communities

First published in 2013 by AIATSIS Research Publications

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National Library of Australia Cataloguing-in-Publication entry:

Title: Information technology and indigenous communities / Lyndon Ormond-Parker, Aaron Corn, Kazuko Obata and Sandy O'Sullivan (eds).

ISBN: 9781922102164 (paperback)
9781922102171 (ebook)

Subjects: Information technology—Australia.
Indigenous peoples—Australia—Computer network resources.
Indigenous peoples—Social conditions—21st century.
Aboriginal Australians—Computer network resources.
Aboriginal Australians—Social conditions—21st century.
Torres Strait Islanders—Computer network resources.
Torres Strait Islanders—Social conditions—21st century.

Other Authors/Contributors:
Ormond-Parker, Lyndon, editor.
Corn, Aaron David Samuel, editor.
Obata, Kazuko, 1967– editor.
O'Sullivan, Sandy, editor.
Australian Institute of Aboriginal and Torres Strait Islander Studies. Native Title Research Unit, issuing body

Dewey Number: 004.6780899915

Cover design by Inprint Pty Ltd
Typeset in 9.5/13 pt Plantin by Midland Typesetters, Australia

Foreword

Marcia Langton

When Lyndon Ormond-Parker, Aaron Corn and Cressida Fforde envisaged convening the first-ever Australian symposium on Indigenous use of information technology and communications, they imagined a small gathering of people like themselves — scholars and practitioners of Indigenous cultural heritage management and expression enabled by digital technology to communicate locally and globally. When they received responses to their invitations, the numbers were overwhelming and they came from across Australia, from people working in fields as diverse as art, media, teaching, language, mapping, archival research, dance and performance, ethnomusicology and museums (see AIATSIS 2009; also AIATSIS 2010a, 2010b). The contributors to this book, *Information Technology and Indigenous Communities*, are working at the cutting edge of their cultural, geographic and disciplinary fields. The sheer innovation, as well as the global reach of Australia's Indigenous communities working with these new technologies, becomes clear in each of these chapters.

That information technology and communication is now a major industry in Indigenous communities across Australia is evident and demands a comprehensive response from governments and service providers.

In Paris in 2001 I said at the international symposium 'Indigenous Identities, Cultural Diversity and Indigenous Peoples: Oral, written expressions and new technologies':

> The Internet differs from other media in that individuals have a high degree of control over the material they can access. Carriage and content are separate, and those who manage the wires are not the same as those who decide what goes down them. This democratic aspect of the Internet encourages the development of networks of individuals who have particular interests. Of course, in community [knowledge centres], access to computers is low, reflecting the proportionally high costs for individuals on relatively low incomes. However, once a threshold has been reached, through schools and community libraries having computer access,

> the transformation and use of the new technologies are the next stage, and this is increasingly evident in Indigenous communities.

It was also evident, I said, that 'Information technologies have an ideal potential to create global democracies based on an increased understanding and acceptance of cultural differences. The potential social benefits are extensive. One of the most important is that it allows Indigenous peoples to position themselves outside colonial nation-states, in the new cyberspace' (Langton 2004).[1]

The situation has changed dramatically since I made these points, as each contributor to this volume shows. This world will continue to change quickly, and policy and infrastructure need to be responsive and well informed. This volume will enable all those involved to understand these issues readily. Each chapter gives us a window onto a cultural project, an innovation, a challenge and a vision. Indigenous citizens of the new cyberspace are inventors and creators, preservers and innovators, and they are also enriching their own societies and global society by enabling access to the Indigenous world through computer or mobile phone screens. They are sharing these technologies with their fellow citizens of the Indigenous world, some of whom switched from sand signs to digital data only two generations ago.

Some of the authors of the chapters that follow are old hands at turning digital technology to the task of communicating complex cultural expressions and concepts. Barbara Glowczewski of L'École des Hautes Études en Sciences Sociales in Paris, and author of Chapter 6, has worked for more than two decades with Warlpiri people and has produced *Dream Trackers* (Glowczewski 2000), the first-ever DVD documentation of art and Dreamings, integrating sacred design and meaning through a digital database. When the project began, with UNESCO support, the idea of using digital technology to present large and complex cultural repertoire was in its infancy. Now, museums and collecting institutions around the world use digital technology, computer screens and digital imagery to enhance the presentation of their material to tech-savvy audiences. So too have Indigenous institutions, from tiny community centres to national institutions, adopted digital technology during the past two decades to strengthen their capacity to preserve Indigenous cultural collections and information, especially because of their vulnerability, high value and the risks posed to their future.

The increased ability to share information, including images, photographs, films and much more, serves the purpose of ensuring the transmission of culture to future generations in the community of origin. During the closing plenary session at the ITIC conference, this fundamental principle of cultural practice was expressed in the ancient concept of Ngapaji Ngapaji, or 'You give, I give', encompassing the Aboriginal tradition of reciprocity, and, in this instance, the obligation of elders to teach younger generations their traditional knowledge and the reciprocal obligation of the young to teach their elders how to use the technology to keep their traditions.

The unique innovations in Indigenous Australia include the development of the Ara Irititja software and project, developed by Martin Hughes and John Dallwitz, initially as a project owned by the Anangu people of the Pitjantjatjara communities. This software has been adopted in many parts of Australia, and other software configurations have followed, as demonstrated in Chapter 7 by Michael Christie, Yiŋiya Guyula, Dhäŋgal Gurruwiwi and John Greatorex, digital educators and innovators working in the Yolŋu cultural bloc. These developments have been described by Lyndon Ormond-Parker in a number of publications, and in Chapter 15 in this volume, written with Robyn Sloggett, he explains that, despite the rapid uptake of information technology (IT) and creative application of these technologies, there are special vulnerabilities and challenges in this field. Ensuring the sustainability of IT hardware and infrastructure in the Indigenous world is essential to providing a range of educational, heritage protection and cultural services such as the Ara Irititja and similar software enables. As Anangu Sally Scales explained in her keynote address to the ITIC conference:

> Ara Irititja means our history or stories from a long time ago and in the mid nineties our senior leaders told Pitjantjatjara Council to start a project to retrieve images and materials that missionaries, school teachers, anthropologists, scientists, doctors and government had collected over time and were keeping in cultural institutions like AIATSIS, several museums and their own private albums. Our old people said that they wanted this information back and to teach the young people...and to keep our culture strong…today Ara Irititja it lives in about forty communities on the [Anangu] lands…We've got items dated as early as 1884 all the way up to 2009…There are films, sound recording, photos, documents, art works, objects and a map. And there's more than 75,000 items in Ara Irititja… [It is used] to connect to family and culture, [and] for teaching, learning and…for entertainment…[and there are private collections for] women's only and men's only business and they're in separate computers, separate archives.

The software platform has been revised by its developers, Hughes and Dallwitz (2007), so that its server and browser configuration will run on Linux, Windows and Mac. At the conference, Sally and her mother demonstrated the Ara Irititja software and how it is used in their communities.

Participants also emphasised the power of this technology to enable efficient and instant communications across rural and remote Australia, traditionally so poorly served by public communications services and where more than a quarter of Australia's Indigenous population lives, indeed in extreme poverty and disadvantage. Mobile telephony is the most appropriate form of community-based communications and is a matter of great urgency to our digital cultural warriors because of the desperate need for national broadband coverage to reach

Indigenous communities. Conference participants during the ITIC plenary session agreed that among the range of policy needs to be included under universal service obligations for telecommunications one of the most important, given the low income levels in Indigenous Australia, is to ensure affordable capped usage for remote and regional communities.

There was a concern to educate the broader public about Indigenous cultural matters, and how this could be achieved was envisaged through the cultural lens: the gathering agreed that the future of the Indigenous film and music industry is in the hands of the future digital generation.

As the symposium statement acknowledged, the presentations at the conference (and the chapters in this book) demonstrate the breadth of Indigenous information technology usage and innovation, as well as its contribution to Indigenous economic and social development (AIATSIS 2010b).

One thing was obvious: the predominance of youth in this revolutionary field and their ingenuity and innovation. The opportunities for Indigenous youth offered by information technology go far beyond personal development; the career opportunities open to them and the pride they take in contributing to their own communities and to the wider society are immense. Specific policy and funding are needed to encourage the engagement of youth in digital media and the digital economy.

Indigenous media organisations play a vital role across Australia, communicating news, education, information and entertainment, and they do so with limited resources and a large dose of volunteership, while providing what is, especially in remote and rural Australia, or in times of emergency and disaster, an essential service. The full scope of activities that local Indigenous media organisations undertake — for example, in health and road safety announcements and education, enabling communications between Indigenous people and government agencies — along with their regular community support services, should be better acknowledged and supported by governments.

Another sector that should be appropriately funded, and which provides another important service, involves the community-based digital archives centres, such as Indigenous Knowledge Centres, that operate across a range of cultural, social and economic domains and support intergenerational links, wellbeing, cultural maintenance, education, employment generation, and training and engagement of young people.

The adoption of information technology and communications innovations in the Australian Aboriginal and Torres Strait Islander communities has been so rapid and transformative that Aaron Corn was moved to coin a new phrase to describe this extraordinary development: 'the Indigital revolution'. The scope and breadth of this revolution across the Australian continent and its islands is acknowledged in the introduction to this volume by Aaron Corn. In writing on the Indigenous mobilisation of information technologies in the past decade, he tells us about a Yolŋu

infant sending a video-mail message to his mobile phone, and learns — when the child's grandfather calls from Elcho Island off Australia's far northern coast — that the child used the mobile phone when it was unattended.

We take it for granted, Corn points out, that digital mobile technology is so powerful that a child is able to communicate in this way across thousands of kilometres. This has led, he further observes, to 'digital democratisation', a process that is 'well underway throughout Australia' and 'rapidly changing the way that Indigenous communities come to know and interact with the rest of the world, and how the rest of the world comes to know and interact with them'. Mobile technology is a growing medium of community-based communications and plays an increasing role as a platform for content creation, distribution and viewing.

Telephony, digital services, high-speed access to the cyberspace and IT capacity are increasingly considered part of the complex of essential services and service entitlements of Australian citizens, subject to regulation and various standards, including service obligations and human rights. Indigenous users are well aware of this, and also that the wealth of the average citizen is more than his or her income-earning capacity. They are also aware that their capacity to participate in the global information democracy made possible by the internet and IT depends on having access to good services. In the 'Statement on key issues' developed by the symposium participants, inclusion of mobile telephony under the universal service obligation to ensure affordable capped usage was identified as a critical area for policy support (AIATSIS 2010b). The development of specific policy and investment to support Indigenous enterprise, training, digital services and access to information communication technologies is now a high priority. The symposium participants considered that the creation of a national body, similar to the Australia Council for the Arts, tasked with supporting this new sector and providing advice to Australian governments, was now essential. Other issues were also identified as key areas for support, including the need for equitable funding to ensure high-speed access to information technology for Indigenous Australians across the country — whether on outstations, in remote towns, or in regional areas or urban centres — by increasing coverage for mobile telephones and/or landline cabling.

The 'Statement of key issues' will be a foundational document for policy development in this area for years to come because of its relevance to the capacity of Indigenous Australians to use the new technologies that have become the norm in industry, administration, the education and health sectors, and in cultural heritage protection. I urge Australian governments to consider these suggestions with the sense of urgency they require. These new technologies will have a substantial impact on the fate of Indigenous communities and their socio-economic status. Their role in 'closing the gap' is easily grasped; Indigenous access to these technologies and their capacity to apply them to their own challenges will be critical to the outcomes. This volume shows us the success in using new technologies in a number of

pioneering projects. More successes of this kind augur well for an information- and culture-rich Indigenous society of the future.

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Note

1. This volume is a collection of papers presented at the international symposium 'Indigenous Identities, Cultural Diversity and Indigenous Peoples: Oral, written expressions and new technologies' in Paris in 2001. The papers are collected on a CD-ROM. [B Glowczewski, L Pourchez, J Rostkowski and J Stanton (eds), *Cultural diversity and Indigenous peoples: Oral, written expressions and new technologies*, UNESCO, Paris, 2004 (CD-ROM)].

Statement on Key Issues Identified at the Information Technologies and Indigenous Communities (ITIC) Symposium, Canberra 13–15 July

An AIATSIS research symposium co-hosted with the Australian National University and the National Film and Sound Archive, and held in conjunction with the National Recording Project for Indigenous Performance in Australia's 9th Symposium on Indigenous Music and Dance.

Introduction

This document sets out key issues identified in the final plenary session at the AIATSIS research symposium on information technologies and Indigenous communities.

Over 70 papers were presented at ITIC on the use of information technologies by Indigenous peoples. Illustrating the strength and vibrancy of the sector, presentations were delivered on programs, projects and research being implemented and undertaken by a range of community organisations, institutions and researchers across Australia.

ITIC demonstrated the growing presence of an impressive and exciting IT sector in which digital media is being used in diverse and creative ways by Indigenous Australians to support, for example, innovation, employment, training and governance, as well as the production, maintenance and transmission of culture. The sector builds on over 30 years of cultural and social capital in IT and Indigenous communities. The use of digital media was showcased in a range of programs and initiatives spanning education, language, health and wellbeing, local and national digital archiving repositories, and the burgeoning creative industries and broadcasting sectors.

The symposium highlighted the ability of IT to generate unique opportunities for income generation and local enterprise development. In particular, ITIC demonstrated the key capacity of IT to engage young people, particularly in creative media, thus

providing new platforms for formal and informal training to support personal and career development.

Overall, the symposium revealed not only the extent and variety of services already provided through IT by Indigenous people for the communities (both Indigenous and non-Indigenous) in which they live, but also the clear benefits arising from increasing engagement with digital media and the digital economy, and the potential for future growth. IT harnesses many crucial aspects associated with the economic future of Indigenous communities across the country.

Key findings

- IT is an essential service that delivers and creates opportunities for economic and social development by and for Indigenous peoples across Australia.
- IT generates unique opportunities for young Indigenous people, and is creating a new generation skilled in digital technologies.
- Investment in Indigenous enterprise in the IT sector will result in significant social and economic benefits for Indigenous Australians, and can make a significant contribution to 'Closing the Gap'.
- Access to IT is crucial to the success of a large range of social and economic activities. Lack of access has considerable implications, and is a serious barrier to successful engagement in the creative and digital economy.
- Indigenous engagement in, and use of, digital media does not conform to a 'one size fit's all' model. It requires investment in digital capabilities at a local level, supported by appropriate national policies and networks.

Key issues

Acknowledging the breadth of IT usage and contribution, the symposium highlighted the need to recognise:

- the importance of IT for Indigenous Australians, including the proven capacity of IT to support Indigenous economic and social development
- that the success of IT in and for Indigenous Australians is fundamentally linked to Indigenous control, participation, agency, contribution and innovation
- the critical importance and relevance of IT for Indigenous youth and the opportunities for meaningful engagement in learning, cultural production, enterprise generation and employment pathways, as well as personal and career development, that it provides
- the full scope of activities undertaken, and support services provided, by local Indigenous media organisations and the need to appropriately support this sector

- that a key role is increasingly played by community-based digital archives (such as Indigenous Knowledge Centres) in a range of cultural, social and economic domains, including programs that support intergenerational links, wellbeing, cultural maintenance, education, employment generation, training and engagement of young people
- that mobile technologies are an important growing medium of community-based communications, and play an increasing role as a platform for content creation, distribution and viewing.

Key areas of support

The ITIC symposium considered that key areas of support for this sector should include:

- the creation of a national body similar to the Australia Council for the Arts tasked with supporting this new sector, including providing advice to government
- recognition of the emergence of IT use by Indigenous Australians as a major industry, and the development of specific policy and investment to support Indigenous enterprise, training, digital services and access to ICTs
- generation of specific government policy and funding to ensure that high speed access to the internet and IT is provided to Indigenous Australians across the country (whether on outstations, in remote towns, regional areas or urban centres) both by increasing coverage for mobile telephones and landline cabling
- specific policy and funding focused on supporting the engagement of Indigenous youth in digital media and the digital economy
- provision of tailored support for informal and formal training initiatives, both in and via digital technologies, that enable engagement in IT at all levels, including content production and related archive management
- increased support for the growth and maintenance of community-based digital archives
- increased support for programs which support the return to community-based archives of digitised heritage objects, including photographs, audiovisual recordings and manuscripts from national repositories
- inclusion of mobile telephony under the Universal Service Obligation to ensure affordable capped usage
- recognition that with the introduction of digital TV by 2013, there is a critical need to continue direct-to-home local broadcast and distribution of community media via television, as well as spectrum availability for both ICTV and NITV.

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Contributors

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Julia Burke is a University of Sydney history honours graduate and has a Graduate Diploma in Development Studies. She has worked for Central Australian Aboriginal organisations in research, project management, evaluation and social history for the past 17 years and is based in Alice Springs. She was research officer at the Ngaanyatjarra Pitjantjatjara Yankunytjatjara Women's Council for eight years, and started working for Ara Irititja in 2002. Her role includes training on communities, working with Anangu on Ara Irititja, finding new collections, working with Anangu women on their restricted materials, monitoring the new software, and assisting organisations that have bought the software to develop their own archives. <Julia.burke@irititja.com>

Debbie Campbell has an IT background. She has been the project manager for many of the National Library of Australia's online services, including Picture Australia, Australian Research Online and digitised historical Australian newspapers. As the Director, Collaborative Services, she has two goals. First, through the management of Libraries Australia and Trove, she supports colleagues in their day-to-day work. Both services are a critical part of the national information infrastructure and provide an unparalleled opportunity for libraries to augment their own services. Second, she focuses on identifying the value that Trove and Libraries Australia provide to ensure an engaging future for memory institutions and their patrons. <http://trove.nla.gov.au/contact>

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Michael Christie worked as a teacher linguist in Yolŋu communities in Arnhem Land for more than 20 years before moving to Darwin to set up the Yolŋu Studies program at Charles Darwin University in 1994. He is currently Professor in the School of Education, working on collaborative research and consultancies in a number of areas including health communication and literacy, resource management, Yolŋu epistemology and schooling, and Indigenous and trans-disciplinary methodologies and knowledge work in a postcolonial institution. <michael.christie@cdu.edu.au>

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Dr Aaron Corn works with endangered intellectual traditions that remain fundamental to Indigenous cultural survival in remote Australia and inform contemporary Indigenous engagements across different legal systems and cultures. Focusing on Indigenous initiatives in music and dance, festivals and film, recording and archiving, and law and politics, his research foregrounds the unique perspectives of Indigenous peoples on current public and academic debates over the cultural, economic and political futures of their communities. Aaron collaborates with Indigenous elders to create seminal records of their endangered performance traditions, and works through the Pacific and Regional Archive for Digital Sources in Endangered Cultures (PARADISEC) and the National Recording Project for Indigenous Performance in Australia to field test new digital recording technologies and archiving protocols. Through his current Australian Research Council Future Fellowship, he collaborates in these initiatives to apply Semantic Web techniques to digital archives management for endangered cultural resources. <Aaron.Corn@anu.edu.au>

John Dallwitz studied architecture and art teaching in Adelaide before concentrating on photography and heritage conservation. Since 1986 he has worked exclusively on Aboriginal community heritage projects. In 1991 he was commissioned to create a historical photographic exhibition celebrating the tenth anniversary of Pitjantjatjara Land Rights. This led to ongoing work on Pitjantjatjara and Yankunytjatjara history. He is now Archivist and Manager of the Pitjantjatjara Council's Social History Unit. Since 1994 he has managed and co-ordinated the development of the acclaimed Ara Irititja archival project. <john.dallwitz@irititja.com>

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Daniel Featherstone is the General Manager for the Indigenous Remote Communications Association (IRCA), having worked with IRCA since 2010 as Policy and Project Officer and as a consultant to the remote media and communications industry. Prior to this, he worked from 2001 to 2010 as Coordinator of Ngaanyatjarra Media in the remote Ngaanyatjarra Lands of south-east WA. He helped build the organisation from a single staff posting to employing over 25 people (20 Indigenous) and providing a broad range of programs — radio, video, IT, music development, archiving and technical services. Highlights include the building of a $2.5m media and communications centre, advocacy for a regional broadband network with last-mile WiFi distribution, establishment of a network of online community media e-centres, initiating a music development program, cultural recording program and Technical Services Unit. Daniel is currently completing a Research Masters project looking at the development outcomes of media and communications programs in remote Indigenous communities and future directions for the remote media sector. Prior to working in remote media, Daniel worked in the film and TV industry for 11 years and has won numerous awards for his work as a cinematographer. He has completed a Bachelor of Arts in Cinematography at the Australian Film, Television and Radio School, a Bachelor of Applied Science (multidisciplinary) and a Post-Graduate Diploma in Communications. <manager@irca.net.au>

Barbara Glowczewski has a professorial research tenure at the Centre National de la Recherche Scientifique (CNRS) and lectures at L'École des Hautes Études en

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Shortened forms

3G	Third Generation
5NPY	5 Ngaanyatjarra Pitjantjatjara Yankunytjatjara (satellite radio network)
ACIKE	Australian Centre for Indigenous Knowledge and Education
ADSL	Asymmetric Digital Subscriber Line
AIATSIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
AM	Member of the Order of Australia
APY	Anangu Pitjantjatjara Yankunytjatjara
ARC	Australian Research Council
ATM	automatic teller machine
BDSL	Business Digital Subscriber Loop
BIA	Backing Indigenous Ability
BRACS	Broadcasting for Remote Aboriginal Communities Scheme
CAAMA	Central Australian Aboriginal Media Association
CAYLUS	Central Australian Youth Link-Up Service
CD	compact disc
CDEP	Community Development Employment Project
CDMA	Code Division Multiple Access
CD-R	compact disc — recordable
CD-ROM	compact disc — read only memory
CD-RW	compact disc — rewritable
CDU	Charles Darwin University
CNRS	National Scientific Research Centre
DCITA	Department of Communications, Information Technology and the Arts
DEWHA	Department of the Environment, Water, Heritage and the Arts

DNS	Domain Name System
DRCS	Digital Radio Concentrator System
DVD	digital video/versatile disc
DVD+R	digital video/versatile disc plus recordable
DVD+RW	digital video/versatile disc plus rewritable
DVD-R	digital video/versatile disc — recordable
DVD-RAM	digital video/versatile disc — Random Access Memory
DVD-RW	digital video/versatile disc — rewritable
EPIRB	Emergency Position-Indicating Radio Beacon
EVTV	Ernabella Video and TV
FSO	Future Skilling Outback
G4	Fourth Generation
GB	gigabyte
GPS	Global Positioning System
HCRC	High Capacity Radio Concentrator
HF	High Frequency
HTML	HyperText Markup Language
ICT	information and communication technology
ICTV	Indigenous Community Television
IP	Internet Protocol
IPTV	Internet Protocol Television
IRCA	Indigenous Remote Communications Association
ISDN	Integrated Services Digital Network
IT	information technology
ITIC	Information Technologies and Indigenous Communities
jpg	Joint Photographic Experts Group
kbps	kilobits per second
KFHS	Koorie Family History Service
KHA	Koorie Heritage Archive
LCD	liquid-crystal display
LKC	Libraries and Knowledge Centre
Mac	Macintosh
MITE	Modular Interactive Technology Environment

MLC	Member of the Legislative Assembly
MMS	Multimedia Messaging Service
MP3	Moving Picture Experts Group Layer-3 Audio
NAA	National Archives of Australia
NBN	National Broadband Network
Next G	Next Generation
Ng	Ngaanyatjarra
NITV	National Indigenous Television
NLTP	Ngaanyatjarra Lands Telecommunications Project
NMAI	National Museum of the American Indian
NPY	Ngaanyatjarra Pitjantjatjara Yankunytjatjara
NRP	National Recording Project for Indigenous Performance in Australia
NTL	Northern Territory Library
NTN	Networking the Nation
OAM	Medal of the Order of Australia
OCR	optical character recognition
ODSAS	Online Digital Sources and Annotation System for the Social Sciences
OHU	Oral History Unit
OS	operating system
PARADISEC	Pacific and Regional Archive for Digital Sources in Endangered Cultures
PAW Media	Pintupi Anmatyerr Warlpiri Media
PBL	Problem Based Learning
PC	personal computer
PY Media	Pitjantjatjara Yankunytjatjara Media
QC	Queen's Council
R	recordable
RAM	Random Access Memory
RIBS	Remote Indigenous Broadcasting Service
RIMO	Remote Indigenous Media Organisation
RW	rewritable
SBS	Special Broadcasting Service

SMS	Short Message Service
SRC	Strehlow Research Centre
TAFE	Technical and Further Education
TAPRIC	Telecommunications Action Plan for Remote Indigenous Communities
tiff	tagged image file format
TV	television
UNESCO	United Nations Educational, Scientific and Cultural Organization
USB	Universal Serial Bus
USO	universal service obligation
UV	ultraviolet
VET	Vocational Education and Training
VoIP	Voice over Information Protocol

Introduction: The Indigital revolution

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It's nearly 2 pm in central Canberra in early June 2011, and I'm heading out for my afternoon coffee when my phone buzzes in my pocket. I fish it out to see who is chasing me, and find that someone has sent me a video-mail message. I don't recognise the number and think this is unusual as people hardly ever send videos to my phone. I tap the play icon on the screen and the video begins. A small shirtless child with dark brown skin appears on screen, looking at himself on the sender's phone. I can see his mouth and shoulders, but he hasn't managed to put his entire face in frame. Curious to know who my infant friend is, I reply with a text message, 'Wow! Who was that?' Within a minute, a call comes from the same number. 'Did I just call you?', says a familiar male voice. It is Brian Brown, the son-in-law of Joseph Neparrŋa Gumbula, my oldest Indigenous colleague from Elcho Island in Arnhem Land, and father to most of Joe's grandchildren. 'Ah, Brucey must have been playing with my phone', explains Brian, before admonishing himself for leaving it within his tiny son's reach. We chat for a few more minutes about the family before moving on with the day.

Welcome to Australia as the twenty-first century's second decade begins: a country where a small Indigenous child living in a remote island town off the far north coast can unwittingly pick up his father's phone and send a video of himself to his grandfather's colleague nearly 4000 kilometres away in the nation's capital. Those of us who have lived in major cities over the past two decades have taken for granted the evolution of the mobile phone from unwieldy brick-like object to smart palm-sized computer with digital media and wireless networking capabilities. That a small child can send a video of himself will therefore seem not at all remarkable to many. These days, infants all around the world perform such feats all the time.

It is remarkable, however, that like many Indigenous communities located in regional Australia there was no mobile phone coverage on Elcho Island before 2006. Personal computer ownership and home internet access are also scarce, which makes young Bruce Brown's generation the first to grow up in an Arnhem Land where smart phones and similar devices can browse the web, and can create, send and receive digital

media and information with great ease. Even now, these unwired devices are having an immediate impact on the way that Indigenous Australians of all ages and backgrounds are accessing the internet; staying in touch whether locally or over vast distances; creating, finding and sharing ideas and media; and determining for themselves how they and their communities are represented via the internet and in the greater world. On Facebook alone, I personally have more than 1100 friends of whom most are Indigenous Australians living outside major cities. In microcosm, this suggests a rapid nationwide uptake of information technologies (IT) among Indigenous Australians that was unthinkable even five years ago, particularly among those living in remote communities, and is unprecedented in our nation's history. Despite limited regional access to the private computing facilities and public communications infrastructure that most Australians in cities take for granted, a process of digital democratisation is nonetheless well underway throughout Australia, and it is rapidly changing the way that Indigenous communities come to know and interact with the rest of the world, and how the rest of the world comes to know and interact with them.

These were the conditions that inspired our ideas for the Information Technologies and Indigenous Communities (ITIC) Symposium in Canberra on 13–16 July 2010. Its focus on IT was the brainchild of Lyndon Ormond-Parker, an Indigenous Australian PhD scholar at the University of Melbourne. His experiences of negotiating the homecoming of Indigenous human remains from Britain to Australia early last decade made him realise the potential of the web as a tool for pooling intelligence about collections and their contents to ensure that individual efforts to locate Indigenous heritage in often disparate international collections could be discovered and followed by others. His doctoral research, funded by the Australian Research Council (ARC), focuses on the use of IT, and particularly social history databases, by Indigenous communities. With the support of his ARC fellowship, a grant from the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) and additional financial support from the World Archaeological Congress, Ormond-Parker was able to pursue this vision in 2008 with his significant contribution to eMob, a pilot project for an online guide to Indigenous Australian cultural heritage housed overseas. Undertaken with Cressida Fforde and Gary Pappin for the Murray Lower Darling Rivers Indigenous Nations, eMob worked with eight Aboriginal nations, four United Kingdom collecting institutions and the University of Southampton to develop processes and IT to make information about overseas holdings more accessible to their source communities (eMob 2008).

In September 2009 Ormond-Parker convened the Reconnecting Urban and Remote Communities via New Technologies stream of the AIATSIS National Indigenous Studies Conference in Canberra (AIATSIS 2009:9–11). Comprising 12 intriguing presentations that demonstrated the centrality of IT to Indigenous initiatives in investigating museum collections, community archiving, digital media production, cultural mapping, distance teaching and learning, and maintaining

endangered cultures and languages, it quickly became apparent to those who were present that a quantum leap in Indigenous community engagements with IT was revealing itself to us across a surprising new breadth of modalities that we were not entirely equipped to understand.

The role of the ITIC Symposium in July 2010 was therefore to understand the scale of this phenomenon, to explore the diversity of Indigenous initiatives and concerns to which information technologies have become both central and essential, and to raise public awareness and increased support for the strong and vibrant IT sector in which many Indigenous Australians are now engaged despite the infrastructural limitations that their communities often experience. Ormond-Parker approached his long-time colleague Cressida Fforde, who was working for AIATSIS, to co-convene the symposium on the institute's behalf. Having just moved to Canberra to commence a new ARC fellowship at the Australian National University, I was also asked to serve as a co-convener. With IT as our central theme, we settled on a nearby venue that stands as an icon of Australia's engagement with technological innovation, the Australian Academy of Science Shine Dome.

Initially, we had envisaged that the ITIC Symposium would be a modest affair attracting some 30 speakers. Yet our call for papers elicited an overwhelmingly strong response from many high-quality presenters, and given my own additional role as Co-Director of the National Recording Project for Indigenous Performance in Australia (Corn (ed.) 2011), my network of colleagues through this initiative also seized upon this opportunity to have our own ninth annual Symposium on Indigenous Music and Dance convened simultaneously with the ITIC Symposium. We were soon faced with the need to program as many as three parallel sessions at once, and were extremely grateful to receive additional support in the form of alternative venues and technical assistance from both the Australian National University and the National Film and Sound Archive. The National Film and Sound Archive, in particular, generously provided its cutting-edge Arc Cinema as the venue for the National Recording Project's Indigenous Music and Dance stream on 13 July, and for the screening of short films by Indigenous Australian artists that followed that evening.

All told, some 250 delegates gathered in Canberra for the ITIC Symposium to share in the presentation of more than 70 papers and workshops (AIATSIS 2010a). These presentations revealed the staggering strength, breadth and vibrancy of grass-roots Indigenous engagements with the IT sector throughout Australia, and also further afield in New Zealand and Canada. The many tech-savvy initiatives discussed throughout the proceedings revealed a compelling groundswell of Indigenous expertise in IT applications for education, health, heritage, languages, mapping, creative arts and broadcasting that might now be harnessed to improve quality of life, educational outcomes and economic futures for Indigenous Australians.

Foreshadowing the central theme of the AIATSIS 2011 National Indigenous Studies Conference in Canberra, 'Young and Old: Connecting generations', on 19–22 September,

the ITIC Symposium also emphasised the important agency of youth in driving both the adoption and innovative application of IT in Indigenous communities. We made concerted efforts to ensure that our overall body of delegates represented a balance of young and old perspectives, and this was reflected in Ormond-Parker's choice of Sally Anga Scales, a young Pitjantjatjara interpreter from Central Australia, to present the opening keynote address on the Ara Irititja database software.

Most presentations were videoed, including Scales' opening address, and 29 were uploaded to an ITIC channel on the video-sharing website Vimeo, where they can now be viewed publicly (AIATSIS 2010c). The more that delegates discussed and compared their own work with others, the more evidence we saw of a vital new Indigenous IT sector emerging before us, and it was this shared realisation that compelled the ITIC Symposium to release a collective 'Statement on key issues', which we drafted at the final session (AIATSIS 2010b).

As another key published outcome of the ITIC Symposium, this book explores some of the most innovative and compelling Indigenous applications and adaptations of IT in Australia today in the words of the inspirational individuals behind their creation, implementation and ongoing development. In sum, these endeavours evidence nothing less than the emergence this century of an 'Indigital Revolution', a new wave of tech-savvy initiatives in which Indigenous communities across Australia have risen to the fore as confirmed IT adopters. Despite the considerable infrastructural limitations across much of Australia's landmass, they have made concerted efforts to harness the many benefits of IT to strengthen social enfranchisement, economic development, cultural survival, educational achievements and healthy lifestyles, and have turned them to their own specific needs at whatever technological entry level has been locally attainable. Though representing only a small slice of presentations offered at the ITIC Symposium and the Reconnecting Urban and Remote Communities via New Technologies stream of the AIATSIS 2009 National Indigenous Studies Conference, the following 16 chapters nonetheless attest to the enthusiasm with which Indigenous communities across Australia are embracing, adapting and constructively critiquing the abilities of emerging IT solutions to meet these ends.

Laurel Evelyn Dyson and Fiona Brady (Chapter 1) examine how, since the rollout of the Telstra 3G network in the Wujal Wujal Aboriginal Shire in January 2008, mobile phones have become essential tools for communicating with family, friends and colleagues, capturing and sharing multimedia resources, and accessing the internet. They nonetheless contend that service providers have yet to realise the full potential of mobile phone technology to develop capacity, improve services, and sustain culture and language revitalisation for Indigenous communities. Supporting this argument is Daniel Featherstone's examination (Chapter 2) of how, since 2004, the similarly rapid adoption of broadband services by the Ngaanyatjarra people of the Western Desert has resulted in a range of relevant and meaningful IT programs through Ngaanyatjarra Media that enable active Indigenous engagement in creating and accessing local

music and media content, building regional language and cultural maintenance programs, and accessing digitised archival materials.

The title of Featherstone's chapter recalls the seminal work of Eric Michaels (1986), who investigated similar adaptations and acculturations of television by desert communities following its introduction to remote Central Australia in 1982, and Inge Kral (Chapter 3) demonstrates how the digital media practices of Indigenous youths in Central Australia today are often extensions of established approaches developed by older local media workers who trained on analogue formats. Kral identifies the importance of collective and participatory access and discovery contexts that lie outside formal institutional and instructional settings for building digital media literacy and competencies in Indigenous youths. This observation is well supported by the work of Cat Kutay and Kaye Mundine (Chapter 4), who suggest that Indigenous students are best trained for the IT sector through practical and inclusive discovery-driven learning experiences that hold cultural and personal relevance. They have found Web 2.0 social media and wiki interfaces to be among the best existing tools for achieving these outcomes. Kutay also explains how her work with Richard Green (Chapter 5) has led to the creation of a highly interactive Web 2.0 platform through which multimedia resources for the reclamation of the Dharug language of Sydney can be shared publicly.

Barbara Glowczewski (Chapter 6) shows us how existing digital tools can be manipulated and mobilised to faithfully reflect Indigenous epistemologies within their own frames of reference for an array of outcomes for cultural maintenance, and for education on both local and global fronts. In the 1990s Glowczewski worked with 50 Warlpiri artists from Lajamanu to create the *Dream Trackers* CD-ROM (Glowczewski 2000), which is now being developed into a live website with potential economic returns for the community from external subscribers. Glowczewski also addresses how Warlpiri intermediaries such as Steven Wanta Patrick Jampijinpa, the Creative Director of the Milpirri Festival at Lajamanu, are now creating video content specifically for YouTube as a means of communicating their traditional worldviews and their intercultural resonances to a global internet audience (Patrick, S 2008; Patrick, S and Patrick, J 2010; Patrick, S et al. 2008; Patrick, J 2011). Michael Christie, Yiŋiya Guyula, Dhäŋgal Gurruwiwi and John Greatorex (Chapter 7) also demonstrate how IT is enabling remote Indigenous communities to reach new markets like never before with their cutting-edge marriage of laptop computers with G4 modems, screen-sharing software and Skype to create telepresence connections that allow Yolŋu elders in Arnhem Land to teach university students around the world without leaving home.

Sandy O'Sullivan (Chapter 8) initiates discussion about an increasingly prevalent application of IT in contemporary Indigenous communities — the aggregation of digitised heritage resources from collections worldwide for community access via local databases — and questions whether the digitisation of existing collections, such as those held by museums, brings them into renegotiated relationships with Indigenous

communities over ownership and control. The Ara Irititja database that was developed with the Anangu communities of Central Australia, discussed here by its developers Sally Anga Scales, Julia Burke, John Dallwitz, Susan Lowish and Douglas Mann (Chapter 9), has been particularly influential in this regard. Developed over nearly two decades of community consultation and testing, Ara Irititja makes it possible for the many records once collected and disseminated globally by missionaries, explorers and collectors to be returned home for community use. The Northern Territory Library (NT Library) is presently collaborating to develop a new version of the Ara Irititja software (which NT Library initially called 'Our Story' but has now rebranded as 'Community Stories') for use with differing bodies of local heritage content across its network of Libraries and Knowledge Centres in 22 Indigenous communities.

The Koorie Heritage Archive, discussed by Sharon Huebner (Chapter 10), is also based on the Ara Irititja model as applied to the Victorian context of the Koorie Heritage Trust. Other institutions with significant Indigenous collections that have embarked on digitisation and database initiatives in response to community demands for access to their collections include the Strehlow Research Centre, discussed by Michael Cawthorn and Hart Cohen (Chapter 11), and the University of Sydney Archives, on which I myself have worked with Yolŋu elder Joseph Gumbula and reference archivist Julia Mant. This latter collection holds many early photographs and related resources documenting Yolŋu life in Arnhem Land from the mid-1920s onwards, and here we discuss their preparation for community release with respect to both traditional ownership and access protocols (Chapter 12), and to professional archival responsibilities as explained by Mant (Chapter 13).

Debbie Campbell's discussion of Trove (Chapter 14), the National Library of Australia's revolutionary new discovery engine that enables integrated searches across participating collections nationwide, offers an alluring model for how Indigenous materials from a plethora of different collections could be made more accessible via a unified search engine that also allows users to add their own tags, comments and rankings to individual resources. While there is enormous enthusiasm for the development of such repositories and local access to them among Indigenous communities nationwide, Robyn Sloggett and Lyndon Ormond-Parker (Chapter 15) remind us that complications often arise when small communities and organisations are faced with staying abreast of rapidly changing formats, complex compatibility issues, unmanageable storage conditions and technological obsolescence, and helpfully propose some practical conservation solutions to avoid permanent data losses.

Finally, my own appraisal of the National Recording Project for Indigenous Performance in Australia (Chapter 16) explores how this initiative was conceived in response to broad Indigenous community concerns for the survival of their music, dance and ceremonial traditions, and how, since 2004, it has grown into an expert network of curators, scholars and Indigenous law holders with the unifying goal of recording, documenting, archiving and strengthening Australia's endangered

Indigenous performance traditions using the best technologies practicable in alignment with established world's best practice (IASA 2011).

In preparation for drafting our 'Statement on key issues' during the final session of the ITIC Symposium (AIATSIS 2010b), we invited Marcia Langton to the Shine Dome podium. She remarked how delighted she was to discover the extraordinarily positive momentum that so many worthwhile IT projects had engendered in Indigenous communities nationwide, and likened this current situation to the compelling upsurge of professional creative activity that led to the establishment of the Australia Council for the Arts in 1973. While many of our delegates had rarely found opportunities to compare their experiences with others outside their own established sectors, Langton pointed out how from content creation to consumption, from broadcasting to archiving, and from training to research each of these sectors is now underpinned by a common battery of technologies and techniques that unifies them as a new community of professional practice, and a new Indigenous IT sector that holds vital implications for the cultural, educational and socio-economic futures of Indigenous Australians and the broader intercultural communities in which they also live.

Young Bruce Brown did not wait for permission to start teaching himself how to use his father's smart phone. Indigenous communities will not wait until infrastructural conditions are perfect before embarking on new IT projects to realise their aspirations using whatever technological point of entry is available to them, and considering that the Australian IT industry in its entirety has been estimated as supporting 300 000 jobs and earning $123 billion annually, they are clever not to delay (ABS 2008).

But will Bruce have the chance to become a software engineer, an internet entrepreneur, a media personality, a leading filmmaker, an IT lecturer, director of an archive or, much like his grandfather, a traditional ceremonial leader and a researcher who digitises collections of his people's heritage from all over the world for local community access? Many such futures are being seeded right now. After presenting at the ITIC Symposium, Curtis Taylor, a young Martu media worker from Newman in Western Australia, was struck with an idea for his first narrative short film, *Mamu*, which references traditional Martu culture and horror genre storytelling techniques to illustrate the continuing importance of respecting sacred law. He drafted the script on the plane home from Canberra, raised funds for training and production expenses from CuriousWorks, Martu Media and Country Arts WA, and by September 2011 had completed his first director's cut (Taylor 2011).

Whether such careers can flourish in globally competitive ways depends on what we now do as a nation to seize the burgeoning opportunities of the Indigenous IT sector, to provide it with the best infrastructure and resources possible across the whole of Australia, and to nurture learning pathways that build on the affinity of inquisitive youths with IT tools and articulate into attainable digital economy careers. So let's hope that Bruce can grow up to make a big film one day, and if he does he should cast Sam Worthington as me, but without the digital blue skin.

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Chapter 1

A study of mobile technology in a Cape York community: Its reality today and potential for the future

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Abstract: *This chapter presents a study of mobile technology adoption and use by an Aboriginal community in Cape York undertaken for the Wujal Wujal Aboriginal Shire Council. The installation of a Telstra 3G mobile phone network in January 2008 represented a major change in the provision of information and communication technologies (ICT) to this and many other communities in the Cape. The study showed high rates of ownership of mobile phones and MP3 players. Mobile phones had become an essential tool for communicating with family and friends and for work, and in addition people made good use of the multimedia and internet features of their phones. Key factors in the acquisition of mobile phones were identified as the superior cost management that mobiles offered over other ICT, and their multimedia functionality and portability. The total design of the mobile service in terms of hardware, functionality and billing options was seen as superior from a social construction perspective. Major deficits uncovered by the study include the limited mobile coverage in areas frequented by community members, the high costs of mobile phone calls, and the lack of recognition of the potential of mobile technology to develop capacity, improve services, and sustain cultural and language revitalisation.*

Introduction

Until the introduction of mobile technology in recent years most Indigenous Australians had been low users of ICT. Various studies confirmed the poor rates of private adoption of fixed-line phones, computers and the internet by Indigenous people (DBCDE 2012; DCITA 2002; RTIRC 2008). The Australian Government, in searching for ways to bridge the digital divide and support Indigenous people to gain better access to ICT, had limited success due to the assumption primarily of a top-down model that focused on improving infrastructure (Dyson 2006). Government subsidies to encourage adoption of ICT services generally had a low uptake and were criticised for being unresponsive to Indigenous needs (PY Media 2004). The main exceptions to this were the ICT-rich environments of schools and workplaces, where children and employees learned computer skills and passed them on to other members of their communities.

The installation of mobile phone networks changed all this, with research showing significantly greater adoption of mobile phones by Indigenous Australians than any previous ICT in those communities with mobile phone coverage (Auld et al. 2012; Brady et al. 2008; Dyson and Brady 2009; Tangentyere Council and Central Land Council 2007). Mobile phones provide both communication capabilities and internet access now that internet-enabled (3G, or Third Generation) phones have become the norm, even in such remote areas as Cape York in Queensland, Maningrida in the Northern Territory and the Ngaanyatjarra Lands in Western Australia. Additionally, a high adoption rate of mobile phones has been noted in communities with no mobile network, in these cases enabling communication when people visit neighbouring towns that have access or for use as media storage devices (Featherstone 2011). Given Indigenous Australians' leapfrogging over older ICT to adopt the most up-to-date technology in the form of 3G mobile phones, it is time to study this technology in more detail. A greater understanding of Indigenous adoption is needed in order to imagine how the technology might be used to benefit Aboriginal and Torres Strait Islander communities.

This chapter provides the results of a case study of mobile technology adoption and use by residents of Wujal Wujal, a small township (population 305) located in Far North Queensland and categorised as 'remote' (ABS 2006). Most Aboriginal people live in the town, but some reside in other parts of the Bloomfield River Valley, such as Ayton (Jajikal) locality and China Camp outstation. Wujal Wujal is typical of most remote communities in having no industry as such and few permanent jobs. However, it has a range of services, including a primary school, Indigenous Knowledge Centre, Cape York Digital Network Centre, a clinic, a post office with bank facilities, and council offices, and also has a store in town and two shops in other parts of the valley, all of which sell prepaid mobile phones and recharges. People travel to the nearest town

of Cooktown or to Cairns, one-and-a-half to two hours away, for shopping, business, entertainment, and to visit family and friends.

The chapter begins with an overview of existing studies of mobile technology adoption and use by Indigenous Australians. The research methodology is then described and the findings are presented, including mobile technology ownership and common uses. We analyse inhibitors of mobile phone use, and discuss the place of mobile technologies in the overall provision of ICT in Wujal Wujal. Then we explore further opportunities and potential applications for this technology to meet gaps in existing ICT service provision and in improving the lives of local people, including its potential for culture and language revitalisation. While the focus of the study is the mobile phone, we also comment on another mobile technology that has been adopted by the community, the MP3 player, and on other available ICT, such as fixed-line phones, the public telephone, and computers and the internet. This is necessary, as a new technology cannot be seen in isolation, but interacts with and is supported by other technologies in use at the same time. We invoke Morsillo's (2008) analysis of the social construction of the fixed-line phone to compare the successful adoption of mobile technology with the poor uptake of other ICT.

Studies of mobile technology in Indigenous Australian communities

The first, largely quantitative study of Indigenous mobile phone use was conducted at Alice Springs prior to the widespread adoption of 3G phones (Tangentyere Council and Central Land Council 2007). The study found that 56 percent of survey participants had a mobile phone, a lower percentage than the general Australian population at that time (88 percent), but far higher than the level of ownership of either home phones or computers by Aboriginal people. The main uses of mobiles identified by the study were to stay in touch with family and friends, followed by emergency use. A major issue was the cost of services, with mobile phone owners spending on average $42 of their fortnightly income on their mobiles, which represented 18 percent of the then Community Development Employment Project (CDEP) rate of pay for an adult. The study concluded that mobile phones must now be considered a necessity, not a luxury, since they provide telecommunications to people with limited access to home or public telephones.

A second study of mobile phone communication on Dauan Island in the Torres Strait found that the popularity of mobile phones derived from a number of factors related to both cost and human use issues (Brady et al. 2008). On the cost side, mobile phones had been adopted because of their relatively low cost compared to other ICT, the fact that there was no connection fee, the ease of management of prepaid usage charges, and the control over who used one's phone (as it was considered a personal device, usually kept securely on the person of the owner). Human factors

that contributed to their popularity included greater privacy in taking calls, as the user could carry the phone outside and away from people. Most importantly, phones fulfilled both local communication needs as well as the need to converse with the diaspora of family members and friends who had moved away from the island for school or work. A significant finding of this study was the high use of the Indigenous language Kala Kawaw Ya both in phone calls and text messages, indicating that mobile phones might be useful in reviving endangered Australian languages for the younger generations.

A case study in a rural Aboriginal community in Victoria focusing on financial literacy training for adults again found that mobiles were important tools for solidifying existing social ties (Sinanan 2008). Mobile phone use was reported by the Aboriginal trainees to be ubiquitous, with people seeing it as an extension of face-to-face interaction. Calls and text messages to friends and family were highly normalised and highly visible, with participants in the course often receiving calls and sending text messages in the middle of discussions, workshops and shared meals. However, there was a reluctance to use mobile phones for more formal purposes such as phone or internet banking.

Other research conducted at the Lockhart River community in Cape York moved away from a purely communication focus to investigate 3G uses of the technology (Dyson and Brady 2009). The study showed that there was a keen interest in the multimedia capabilities of mobile phones, with almost all users listening to music on their phones. Playing games and taking photos or videos were also popular. There was a perception by management that mobile phone ownership had only become common since the 3G network had replaced the older CDMA (Code Division Multiple Access — voice and text message only) mobile network, which indicated that the multimedia features and/or internet capability of the new phones were key drivers in the increase in mobile phone adoption. A disappointing finding was that government and service providers had not made use of this capability in the community. Apart from the issue of mobile phones to supervisors at the CDEP office to improve work coordination, there were no mobile phone applications for health, education or other services.

Examples of the ways in which mobile technology has been employed to improve services for Indigenous people in Australia come largely from the field of education. Mobile phone calls and text messages were used effectively for the recruitment and organisation of adults in the financial literacy course reported above (Sinanan 2008), and children have been taught mathematics via mobile phone applications (AED 2007). The multimedia capabilities of mobile devices have been used to record evidence of prior learning and current competence for compilation into m-portfolios to assist adult learners in the vocational education and training sector in the Northern Territory gain recognition for existing skills (Wallace 2009).

Research methodology

This case study was undertaken for the Wujal Wujal Aboriginal Shire Council. It was based on interviews, measurements of mobile coverage, observations and an examination of existing documentation. The research was conducted from late 2008 to 2009, beginning about ten months after the replacement of the older CDMA mobile network with the 3G network. It largely employed qualitative research methods because these provide rich description and explanations (Trimarchi 1998) and are best suited to uncovering attitudes and issues surrounding technology uptake and use. Observations made by the researchers were tested against the perceptions of local residents.

Twenty-seven interviews were conducted with four groups of people at Wujal Wujal: seven managers and three Aboriginal shire councillors who were all high-end users, another six high-end users, and 11 low-end users. Apart from most of the managers, all interviewees were Aboriginal members of the community, and the majority were selected purposively on the basis of their roles in the community or were recommended to the researchers as heavy users of mobile technology. Only the low-end users were selected at random. The interviews took place in term time and therefore did not include high school children, who would have all been away at boarding school. Genders of the interviewees were also skewed, with more of the high-end users being female and more of the low-end users being male. Hence, any quantitative results from the interviews can be taken only as indicative. Interviews with the managers followed no predetermined format, with questions varying according to the role and expertise of the interviewee. Interviews with the Aboriginal councillors and high-end users also varied according to the responses and knowledge of the respondent, but could include questions about whether they had a mobile phone and why, where they had obtained it, what they used it for and how often, who they contacted, where they used it, what places they called, where they obtained their multimedia content, how they managed costs, whether they had an MP3 player and why, and issues surrounding mobile phone use. Questions to low-end users were more limited, particularly as some did not own a mobile, and focused on ownership and use.

For the mapping of mobile phone coverage, the researchers received reports by various residents that information provided by Telstra did not correspond with actual coverage. Telstra states that the maps of mobile phone networks in Australia are likely areas of coverage but are not definitive (Telstra 2008). Phone coverage was therefore measured by registering connectivity and signal strength on a Telstra ZTE F156 mobile phone, one of the most common models on sale and in use in Wujal Wujal at the time, which was designed specifically for remote area use on the Telstra network. In addition, in order to make the results meaningful, coverage was mapped at sites where residents lived or were in the habit of visiting within the Bloomfield River Valley.

Data collected was verified by talking with locals about their own experiences of making mobile phone calls or sending text messages in each designated place.

Mobile technology ownership and use

Mobile technology ownership

There was a perception among interviewees of widespread mobile phone ownership in Wujal Wujal. A typical comment was that 'just about everyone has them'. The research showed that more than half of our sample of high-end and low-end users owned at least one mobile phone at the time of the research (Table 1). This accords with previously published studies of Indigenous ownership of mobile phones (Dyson and Brady 2009; Tangentyere Council and Central Land Council 2007) and with a study undertaken since our research concluded (Auld et al. 2012). Some people shared a phone, while at the other extreme one person had two phones and five people were on their second phone. Of these five high-end users four had previously owned CDMA phones and thus had been early adopters. There was some disagreement among interviewees as to whether primary school children had them, although none of the three children interviewed in this age bracket possessed phones. Children away at boarding school were certainly seen to have them in order to keep in contact with parents, hence the typical comment, 'All the kids have them at school there'. Most people carried their phones with them all the time and had them turned on.

Table 1: Ownership of mobile technology

Technology	Owners (No. of respondents)	Non-owners (No. of respondents)
Mobile phones (n = 20)	11	9
MP3 player/iPod (n = 14)	5	8

Note: some interviewees did not comment on MP3/iPod ownership.

As well as mobile phones, a number of residents owned MP3 players. Four interviewees had both types of devices, while one man who had previously owned a phone was now solely interested in his iPod. Anecdotal evidence suggested that local sales of MP3 players had declined since the introduction of 3G mobile phones. One reason given for not owning an MP3 player was that music could be listened to equally well on a mobile phone. Some interviewees who did not own an MP3 player themselves noted that their children owned one and this suggests that MP3 players may be seen as a way of avoiding problems with children incurring large phone bills while still affording them the pleasure of music.

Mobile technology ownership by Wujal Wujal people is much higher than their personal ownership of other ICT. By comparison, only seven percent of private dwellings in Wujal Wujal had a fixed-line phone listed in the phone book in 2008/09, which was down from a figure of 14 percent in 2006/07, while only 9.5 percent had internet connectivity in 2006 (ABS 2006; Cooktown School P&C 2006/2007, 2008/2009). The reason for the drop in fixed-line subscriptions is unknown, but coincides with the introduction of the 3G mobile phone network. This demonstrates that mobile devices are the technology of choice for this community.

Mobile technology use

Mobile phones were used for communication by all interviewees who owned a phone (Table 2), often while resident in the Bloomfield River Valley, but also while visiting neighbouring towns or communities. They stated that they made phone calls or sent text messages, or did both. English language literacy was not a major issue, nor was technical literacy in terms of operating these functions.

Table 2: Mobile phone use

Mobile phone use	No. of respondents (n = 11)
Communication Phone calls, text messages	11
Entertainment/multimedia Music, games, movies, photos, TV, sport	8
Personalisation Wallpaper, screensavers, ringtones	6
Internet uses Download music, games, movies; email	5

Note: interviewees could give more than one use.

Most people used their phones to communicate with family and friends. One grandmother said, 'Ring family, ring hospital, friends; maybe ring grandchildren; someone in hospital'. A very important extension of this use for a remote community with no high school was to keep in contact with children at boarding school; as one parent said, 'They can contact me…More for emergencies at school…At that time, I only had a phone at home and don't want to congest the work phones…I would like to be informed by the school about what's going on…Pretty well talk to them every day.' Part of the contact with children at boarding school was transferring money to them via either mobile phone or internet banking. This 'remote mothering' has been reported overseas as extremely helpful where parents are separated from their children (Castells et al. 2007:46).

A new finding, not reported in previous studies, was the surprisingly large number of people (seven respondents) who used their personal phones for work calls. Aboriginal people in Wujal Wujal rarely held managerial roles where a mobile phone came with the position, and some of our interviewees would not have had easy access to an office phone. One aged care worker said, 'I need a phone for three clients…I need a phone for clinic or the police…I'm worried about my clients.' Another woman, who was often on the move, stated that she had 'bought it specifically for work…I like to be contactable…I claim it back on tax.' A young man who was looking for work found his phone essential for receiving incoming calls about new job opportunities. This finding has implications for equity. Should Aboriginal employees be issued with a mobile phone together with some credit to handle work-related calls? It furthermore points to a potential benefit of mobile phones in supporting greater employment in Aboriginal communities.

Another important finding, which confirms previous research at Lockhart River (Dyson and Brady 2009), was the excellent use that many people made of the multimedia capabilities of their 3G phones. Even the figures given in these studies, large though they are, may represent a case of under-reporting since the researchers tried not to put words in the interviewees' mouths by offering any prompts. Listening to music, playing games, taking photos and watching movies, television or sports from Foxtel, and personalising phones with wallpaper, screensavers or ringtones were all very popular. Content was either created by the users (e.g. the taking of photos or videos), received from friends via Bluetooth, or downloaded from the internet over their mobile phones or via a desktop computer. The interest in user-generated content is exemplified by one interviewee's creation of wallpaper and a screensaver from his own photos, while a video taken of a fight in a neighbouring community on a mobile phone went viral: 'Everyone at Wujal was watching it.'

Music was obviously important to owners of MP3 players, particularly since CDs got scratched when driving over rough roads. As one respondent said, 'I can plug it into the car…I like listening out bush and I like music a lot.' MP3 players allowed owners to listen privately to the music they liked as their taste did not necessarily coincide with that of their families. Two people talked of keeping photographs on their players in addition to music.

These multimedia and internet uses of mobile technology point to great potential for capacity building, which is discussed in more detail later in the chapter. The take-up of mobile phones after the 3G network was rolled out also indicates that, apart from some high-end early adopters, the combination of a communication device with multimedia functionality and internet access was a powerful incentive for many Aboriginal residents to acquire phones. This corroborates indications gained earlier at Lockhart River (Dyson and Brady 2009). Certainly the multimedia functions increased the usefulness of their mobile devices, which could be used all the time, even when the owner had no credit to communicate or access the internet.

Inhibitors of mobile phone use

Although most of our interviewees owned either a mobile phone, an MP3 player or both, a number of people did not (Table 1). Reasons provided by the non-owners of mobile phones focused principally on the inoperability of mobiles where they lived, their reliance on other phones in the community, and a lack of interest either in having a mobile phone or in telephone technology more generally (Table 3).

Table 3: Reasons for not owning a mobile phone

Reason	No. of respondents (n = 9)
No signal or phones don't work where interviewee resided	5
Use other available phones (public phone, own home phone, neighbour's phone)	3
No interest in having one	3
Never use a phone	3
Phone damaged and not replaced	1
Cost too much	1
Poor usability of mobile phones	1
Put off by hearing of others' problems with mobile phones	1

Note: interviewees could give more than one reason.

Other than those who were not interested in buying a mobile phone, there were owners who had phones but underutilised them. A typical comment from an interviewee was that 'Sometimes make calls when I have credit…Call only when I need it.' In addition to cost, several interviewees commented on the lack of reception in localities they visited in the valley and beyond. One young man noted that he used his phone in Wujal Wujal, but that when he went to China Camp he could only get a signal as far as the lookout on the China Camp road. In Cairns he could use it, and north of Cape Tribulation, but not all the way down to Cairns. 'Sometimes I take mine in the bush but don't get enough signal', he said. If people lived outside the township of Wujal Wujal there was often no coverage. One young woman noted that 'I can't ring my Mum. She lives at Ayton. I can't contact her on my mobile.'

Limited mobile phone coverage

For both mobile phone owners and non-owners, there was an issue with limited coverage. This restricted use for the owners and dissuaded the non-owners from buying a mobile phone. In Wujal Wujal there is only one tower located on a hill directly overlooking the township. The town thus receives a strong signal, as do areas along the Bloomfield River in a direct line of sight from the tower. However, there are large areas

of the Bloomfield River Valley not presently covered where people live, work or spend their spare time (Table 4).

Table 4: Examples of mobile phone coverage in the locality

Signal strength	Location
Strong	Wujal Wujal
	Clinic
	Along Bloomfield River and at river mouth (fishing)
Weak	Primary school
	Pickersgill Reef (fishing)
None	Airport
	Sports oval
	Jajikal/Ayton (shop and houses)
	Plantation Creek (fishing)
	Most of beach (fishing, camping)

This poor coverage was a concern to a number of the people interviewed and has serious implications for people's lives. The emergency contact provided by mobile phones in case of accidents, health emergencies, bushfires and motor vehicle breakdowns is negated by the lack of coverage on much of the main road, most of the beach, and other areas frequented by local people and tourists. In addition, mobile phones could be useful in important but *non-emergency* situations, such as to let family know if a boat is going to be late returning from fishing, which is a major pastime in the valley, or if the owner has run out of petrol. The small boats or 'tinnies' that are commonly used locally are not normally fitted with marine radios, and the Emergency Position-Indicating Radio Beacon (EPIRB) emergency service is not really designed for these situations.

High cost of mobile phone calls

Apart from the restrictive coverage, the other major factor limiting the use of mobile phones was cost. Curiously, this was not mentioned as a disincentive by most non-owners (Table 3). Table 5 presents a comparison of phone charges at the time of our research for the most basic fixed-line home service, calls from a public pay phone and the standard call rate for a prepaid mobile phone. The comparison is based on local calls as these have been shown to be the major part of Aboriginal phone use (Tangentyere Council and Central Land Council 2007). Assuming that three local calls per day, each lasting on average five minutes, is not excessive, then one sees that mobile phone users were paying a disproportionate amount to stay connected with

family and friends, make work calls and access basic communication services that most Australians took for granted. This cost $389 on a mobile phone versus $47.95 on a home phone or $45 at the public phone booth for one month's usage. These costs were excessive.

Table 5: Comparison of local phone call charges

	Fixed-line phone *Home Line Budget Plus*	**Public pay phone**	**Prepaid mobile phone *Standard Call Rate***
Timed/untimed	Untimed	Untimed	Timed
Monthly rental	$20.95	–	–
Monthly cost of handset	–	–	$10.83
Call connection fee	–	–	$0.30
Local call charge	$0.30	$0.50	$0.39 (per 30-second block)
Example of one month's usage (3 × 5-minute local phone calls per day per month)	$47.95	$45	$389

Note: calculations are based on costs at the time of the study. The mobile phone handset was the basic model in Wujal Wujal, with the cost written off over 12 months.

The realisation of this inequity may have led to Telstra's recent introduction of the *Pre-Paid Simplicity Plan*, which offers much lower rates for recharge, phone calls, text messages and data download. Comparing costs at the time of publication, and making the same assumptions as above concerning the number and length of phone calls, we find that the monthly use of a mobile phone for making calls costs $74.17 compared to $49.95 on a home phone or $45 on the public phone. Though the new rates are more realistic, this still represents a major equity issue since Aboriginal people's main access to ICT is through mobile technology. The study of mobile phone use at Alice Springs found that people on low incomes spent a large proportion of their incomes on their phones (Tangentyere Council and Central Land Council 2007). In our study, interviewees who made liberal use of their phones were spending significant amounts.

Purchasing prepaid phones was the fundamental method of managing costs, and is supported by the local shops, which sell only prepaid mobiles. All of our interviewees had a prepaid mobile phone, although one woman had previously had a monthly plan, but discontinued it after receiving a bill for three or four thousand dollars.

Once people had a prepaid phone, they managed costs by minimising their phone usage. This involved several cost-saving strategies including restricting the use of their phones to emergency calls and to phone calls when away from their fixed-line

home phone; avoiding outgoing calls; replacing phone calls with text messages; and exercising discrimination about who could share their phone. Since most interviewees carried their phones with them at all times, access by others could be easily regulated. For example, one woman noted that there are sometimes issues with family members using other people's SIM cards to gain access to their credit, and swapping the batteries; keeping the phone in one's pocket or around one's neck prevented this from happening.

The place of mobile technology in the provision of ICT

Prior to the introduction of the mobile phone network, residents of Wujal Wujal depended largely on the public provision of ICT, either the public telephone or the various computers scattered throughout the community. At the time of our research, public access to computers was very limited. The Cape York Digital Network Centre had computers and internet access, but the centre was not staffed and so not used by residents other than on two mornings a week when an employment agency opened it for clients. The main opportunity for people to use computers was through school or work. The minority of adults who were employed in offices such as at the council or clinic could use their work computers and the internet, as well as having free use of telephones. More recently, the Indigenous Knowledge Centre has been equipped with computers for use by the public, in addition to the provision of laptops from the One Laptop Per Child program at the local primary school, so access to computers has improved a great deal, although their impact on the community is yet to be evaluated.

Managers and other interviewees complained about poor coordination of ICT services in the community, the absence of back-ups and the lack of local technical support. For example, there were computers in the three libraries in the area (the Indigenous Knowledge Centre, Bloomfield Library and the school library), which received funding from separate sources that did not coordinate with each other. If one service provider needed a computer fixed, a computer technician was called but the other libraries were not alerted that the technician was coming. The expense of bringing in outside ICT experts from a distance of at least 180 kilometres was an ongoing problem. Moreover, there was no technical support available to private ICT users. The lack of a reliable local power supply meant that power surges frequently occurred and that the internet often went down, or rats chewed the cables linking fixed-line phone services to the telephone exchange.

In contrast to this top-down approach to public ICT provision, wherein the government and service providers have made decisions regarding ICT and the technology has often worked poorly, the adoption of mobile phones at Wujal Wujal has been largely user driven, apart from the initial decision to build the local mobile phone tower, which was the result of an agreement between the Queensland Government and Telstra. Because of this, mobile technology has been more reflective of local needs. The

relatively low cost of the devices compared with buying a desktop computer and the advantage of a prepaid service over quarterly billing for fixed-line phones make mobile devices an attainable and manageable form of technology for Indigenous Australians. Interviewees made their own personal choices about whether to buy phones or MP3 players, how they would use them, and where and when they would use them. The multimedia uses of mobile phones show how members of the Wujal Wujal community are making their own decisions, which are very different from public ICT provision.

An important question is why mobile technology has been so popular with residents of Wujal Wujal when they have rejected so many other ICTs. Robert Morsillo (2008), a telecommunications expert at Telstra, examined the disconnect between the standard phone service in Australia and common preferences among Indigenous Australians to explain why so few have a fixed-line phone at home. Building on three of the user characteristics defined by Morsillo and comparing these with the characteristics of the mobile phone user, it can be seen that the design of the mobile phone fits better with the typical user at Wujal Wujal (Table 6). This is one way of explaining the much higher adoption of mobile phones by Wujal Wujal people and other Aboriginal and Torres Strait Islander Australians.

Table 6: Social construction of telephone technology

Fixed-line phone user	**Mobile phone user at Wujal Wujal**	
	User profile	**Fit of mobile phone with user profile**
Urban resident with pre-existing connection*	Remote area resident with few pre-existing connections and no on-ground technicians	Device with no connection fee and cheap enough to replace if malfunctions
Stable household composition*	Extended and sometimes changing household	Portable, personal device that does not need to be shared with everyone
Reasonable and regular income*	Irregular income	Prepaid phone providing phone and internet service when money available and use of other functions all the time
Access to other technology for non-voice services	Interested in voice, SMS, music, movies, sport, photos, video and internet but little access to other ICT	Multifunction device

Note: *assumed characteristics of the fixed-line home phone user defined by Morsillo (2008).

We can extend this analysis to a comparison of the desktop computer and the mobile phone. Given that the 3G phone has much of the functionality of a computer, this is a valid comparison. The social construction of the desktop computer assumes

again that the user is an urban resident with access to technicians when it needs repair, has sufficient income and regularity of income to make the greater initial outlay for the purchase and to pay ongoing costs of maintenance and internet access, has a dedicated space at home to set up the computer (not always the case in overcrowded Aboriginal households) and has a fixed place of usage. Compared with this, the mobile phone costs little to buy, is cheap enough to replace if it malfunctions, and provides connectivity and multimedia functionality whether a person is on country or visiting another community, and its convenient size allows it to be worn around the neck or to fit in a pocket. Bluetooth allows cost-free sharing of files when no money for internet downloads is available and is more effective, given its short range, on a portable device where users are more likely to come into close contact than between fixed-location devices like desktop computers. Again, we can understand why so many Aboriginal people have favoured mobile phones over home computers.

The MP3 player, while offering much more limited functionality, also fits with many of the social and cultural requirements of Aboriginal users. It is relatively cheap to buy, portable, pocket size, allows free sharing of files via Bluetooth and acknowledges the importance of music in the lives of many Aboriginal Australians.

Having identified why mobile devices serve the requirements of the Wujal Wujal people better, we would be foolish to regard this technology as a total solution. The offices of council and service providers still have fixed-line phones and the public phone provides the cheapest option for residents to make local phone calls. The greater screen size, processing power and sophistication of the software on desktop computers means that they have a continuing role in offices for business applications. Moreover, the Indigenous Knowledge Centre computers have an advantage when editing multimedia content, even when it has been captured by mobile devices, and the centre now provides training and editing software for this purpose. We should therefore view mobile devices as part of the rich ICT ecology of the community, with mobile phones the technology of greatest utility for individuals, supported where appropriate by other ICT.

Creative solutions using mobile technology

With the mobile network now in place, a reasonably high level of ownership by more than half of our interviewees, and a demonstrated interest by owners in the wide range of communication, multimedia and internet functions available on these devices, there are many potential applications that could improve services and develop capacity in Wujal Wujal. In the health sector, mobile services could enable more effective health care for patients when away from the clinic, such as SMS reminders to diabetes patients and remote monitoring of health status. In the area of education, mobile devices have already been proven to work with Indigenous people (AED 2007; Wallace 2009), and there are many more possible uses such as SMS reminders to parents of

important dates in the school calendar and follow-up of children who miss school. The application of mobile phones to emergency services is obvious in terms of co-ordinating volunteers, as well as broadcasting SMS warnings through the community about cyclones, bushfires, road closures due to flooding and other natural disasters. Moreover, coordination of employees by supervisors and arranging pickups of work crews could save time and money.

Despite all this potential, the researchers found no evidence of any such applications of mobile technology being taken up by service providers in their delivery of services to Wujal Wujal at the time of our study. This reflected a way of thinking by government that was still largely rooted in the identification of ICTs as fixed-line phones, computers and fixed internet connections.

However, more recently, providers have begun to appreciate the advantage of mobile over fixed-line phones in terms of being able to contact residents at any time, given that people always carry their mobiles with them. For example, in February 2011 the State Emergency Service telephoned and texted updates and warnings to local residents during Cyclone Yasi. To do this they used a mixture of people's mobile and fixed-line phones. Furthermore, the agencies servicing local job seekers now send automatic SMS reminders about interviews to applicants' mobile phones.

Beyond these practical applications of mobile technology there is also enormous potential in the area of culture and language revitalisation. The multimedia capability of the 3G mobile phone offers new opportunities for community members to record important cultural and community content and events and share these among themselves, with other Indigenous groups or with the wider world. Aligned to the rise of user-generated content and the emergence of Web 2.0 file-sharing platforms, such as YouTube and Facebook, Aboriginal people now have the technology to become producers of local content that is culturally appropriate and of particular interest to them. This will add to their existing record of success in television and film production and community radio, but on a more personal level, by placing content production in the hands of every community member who owns a mobile phone. As Kral (2010:4) notes in her study of young Aboriginal people's informal involvement in media production, mobile phones have enabled an 'explosion in digital media practice', with the control of multimedia production moving into the hands of youth and away from the control of institutions like the Broadcasting in Remote Aboriginal Communities Scheme. Audio recordings of traditional stories and songs, or music from the local band, could be made available as podcasts to people with mobile phones or MP3 players. Video recordings of dances, storytellers or events could be turned into vodcasts (video podcasts) for sharing. Mobile phones could be used to revive the local language, for example, through the creation of a dictionary in mobile format of Kuku Yalanji (the language of Wujal Wujal), or through podcasts of language recordings, or simple animations of stories in language for upload to mobile devices. Applications of

mobile technology such as these will provide a new avenue to resist the consumption of mainstream media, which often serves to perpetuate culture and language loss.

Many applications are possible but will continue to be limited by the poor coverage throughout the valley and the high cost of making mobile phone calls. For example, people camping at the beach, or in their homes at Ayton, would miss their medication SMS reminders because they are out of range. The issues of coverage and cost need to be tackled before some of the potential applications can be put in place.

Conclusion

In many respects, mobile technology provides a real alternative for Indigenous people wishing to avail themselves of the advantages of modern ICT. Key factors in Aboriginal people's decision to adopt mobile technology include cost management features (particularly the prepaid nature of the service and the acceptance of mobile phones as a personal device), the multimedia functionality of 3G phones and their portability. The Northern Territory Government is quoted as stating that 'Mobiles are the product of choice in remote, and particularly, Indigenous communities. Prepaid mobile services resolve issues of customers defaulting on monthly payments and also solve problems associated with Indigenous cultural issues of resource sharing' (RTIRC 2008:75). As one of our interviewees said when asked why she had bought a mobile phone, 'It's the go'.

A number of our findings at Wujal Wujal have been confirmed in a more recent study at Maningrida (Auld et al. 2012). That study corroborates the need for people to manage costs (given the high price of mobile calls), their extensive use of the multimedia features and the value of this functionality in allowing continued use of the phone even when the owners have no credit remaining to make calls or access the internet. We concur with the view that Aboriginal users are empowered by the technology, which allows independent choice of entertainment and '(re)creation of their worlds through picture and video recording' (Auld et al. 2012:292).

Now that Indigenous people in remote areas have demonstrated their preference for mobile technology, it is timely to give them a service that is comparable to those provided for many other Australians. First, the high cost of mobile phone calls needs to be resolved by extending the universal service obligation (USO) to include local mobile phone calls made in remote areas. This would involve Telstra charging local mobile phone calls made in remote regions at an untimed rate equivalent to the price guaranteed by the USO for standard fixed-line local phone calls. Second, and equally important, is the need for better coverage so that people can use their mobile phones over their entire local area. This will enable service providers to leverage mobile phone ownership to deliver better services in health, education and other service areas to fulfil the true potential of this technology and develop capacity in the community. Third, Indigenous communities need mobile applications and content

designed specifically for them and by them in order to continue to practise their own culture and language on their own land.

Acknowledgments

The authors would like to thank former mayor Desmond Tayley and the elected councillors of the Wujal Wujal Aboriginal Shire Council for facilitating our study of mobile technology in their community. We especially thank the residents and managers at Wujal Wujal who kindly gave up their time to answer our questions.

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Chapter 2

The Aboriginal invention of broadband: How Yarnangu are using ICTs in the Ngaanyatjarra Lands of Western Australia

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Abstract: *In this chapter I describe how the remote Indigenous media organisation Ngaanyatjarra Media has supported community access to information and communications technologies (ICTs), and the ways in which Yarnangu, the Ngaanyatjarra people, have engaged in locally relevant uses for creative expression, learning, communication, and language and cultural maintenance. I present observations by Yarnangu and others of the outcomes of a range of ICT programs that have been delivered by Ngaanyatjarra Media to communities in the region since 2004. My participatory action research approach is based on nine years of working collaboratively with Yarnangu in all aspects of planning, delivery and assessment of these programs. The chapter outlines the approach taken, outcomes and community uptake, lessons learned and possible futures for remote ICT applications. The ICT programs undertaken in the Ngaanyatjarra region have resulted in active engagement by Yarnangu. Young people are early and fearless adopters of these new technologies, but older people are also using ICTs to access digital heritage archives, entertainment and relevant online services. Although it is too early to assess the continuity of skills development and future usage of ICTs, this early uptake shows that the Ngaanyatjarra Media approach to ICT training and access could be a workable model for delivery in other remote Indigenous regions.*

Introduction

Early days, long time ago, our computer was our family, our people, education out in the bush, just talking and teaching us how to hunt and gather and all that. And nowadays, it's the computer and it's the video that take a lot of pictures

> about what used to happen in those early days, so it can be passed onto all the younger generations, so that they can know that we still are part of the land, the Ngaanyatjarra Lands, where we belong (Daisy Ward, interview with author, 2 July 2010).

In the early 1980s there was significant concern among remote Indigenous people about the potential cultural impact of the upcoming launch of the AUSSAT satellite, which would beam television services into remote Australia for the first time. The Australian Institute of Aboriginal Studies commissioned a five-year research project, undertaken in the Yuendumu community in the Northern Territory by anthropologist Eric Michaels, into the likely impact of mainstream media on Indigenous language and culture there. Rather than accept the premise that Yapa (Warlpiri people) were passive victims of this latest wave of media colonisation, Michaels (1986) inverted the position with his landmark report *The Aboriginal Invention of Television in Central Australia, 1982–86*, which demonstrated the possibility of Yapa as active cultural producers who could use the tools of video production and local broadcasting for language and cultural maintenance outcomes.[1] This project, alongside the media programs of the Central Australian Aboriginal Media Association in Alice Springs and Ernabella Video and TV in South Australia, helped to pave the way for the Broadcasting for Remote Aboriginal Communities Scheme (BRACS), which was established in 80 communities across Australia in 1987.[2] The pioneers of this remote Indigenous community media movement described their practice as 'fighting fire with fire'.[3]

Twenty years later, in 2007, 400 kilometres of fibre optic cable was rolled out across the remote Ngaanyatjarra Lands of Western Australia, bringing broadband communications to an area that was previously one of the most communications-poor regions in Australia. While this new portal for globalisation, and Western media and values, poses yet another potential threat to the social and cultural fabric of this region, broadband infrastructure is crucial to bridging the 'digital divide' and helping to 'close the gap' on government service delivery.[4] In their typically creative and adaptive approach to change, Yarnangu, the Ngaanyatjarra people, are quickly seeking out applications of these new broadband and ICT technologies for self-expression, language and cultural maintenance, and communication. They are still 'fighting fire with fire'.

By building on its strong community ownership and history of media training and production, the regional media organisation Ngaanyatjarra Media has supported Yarnangu to prepare for broadband since 2004 by establishing community access ICT facilities, delivering culturally appropriate training and support, promoting local content production, developing relevant applications, and supporting peer skill sharing. As a result, community use of ICTs is now commonplace throughout the Ngaanyatjarra Lands.

In this chapter I describe some of the ways Yarnangu are actively engaging with ICTs and digital media technologies in innovative and culturally appropriate ways, and provide the Yarnangu views and experiences of broadband and ICTs. Although there is some concern about the impact of more contact with the outside world, the majority see an opportunity to develop new tools and skills for contemporary life. While young people are early adopters of ICTs and mobile technologies, older people are increasingly seeing the possibilities of information technology (IT) in language and cultural maintenance and intergenerational knowledge transfer.

This chapter outlines the approach taken by Ngaanyatjarra Media to facilitating ICT program delivery, outcomes and community uptake, and the lessons learned through this process. It raises the need for appropriately designed ICT equipment, facilities and applications, and ongoing training and technical support programs. It then addresses issues for consideration when introducing ICT programs into remote Indigenous communities, and concludes with a view to future uptake and applications.

Background

The Ngaanyatjarra Lands stretch across an area of approximately 250 000 kilometres in the Great Victorian and Gibson Desert region of Western Australia, which adjoins the Northern Territory and South Australian borders (Figure 1). Yarnangu have maintained a continuous association with their country, and comprise approximately 90 percent of the resident population of more than 2000 people, which is distributed across the region's 12 communities: the largest community, Warburton, and also Warakurna, Tjukurla, Wanarn, Papulankutja (Blackstone), Mantamaru (Jameson), Irrunytju (Wingellina), Kiwirrkurra, Tjirrkarli, Cosmo Newberry, Karilywara (Patjarr) and Pira-Kata (Kanpa). The primary languages spoken in the region are Ngaanyatjarra and Ngaatatjarra, followed by Pitjantjatjara, Pintupi and Wongatha. English is a third or fourth language for many older people.

Ngaanyatjarra Media is based in Irrunytju community, which lies 260 kilometres east of Warburton, and some 10 kilometres from the tri-junction border of Western Australia, South Australia and the Northern Territory. It is one of eight Remote Indigenous Media Organisations (RIMOs) in Australia, and now supports 15 Remote Indigenous Broadcasting Services (RIBS) in different communities of the region.[5]

Ngaanyatjarra Media began in 1992 as Irrunytju Media under the BRACS program. It started primarily as a video production program that recorded cultural activities, stories and events for cultural and language maintenance. Today, its primary aims are to keep language and culture strong using media and ICTs, support self-representation, and provide meaningful training and employment. The scope of its activities include media training; radio broadcasting, both locally and via the regional satellite network, 5NPY; video production; television broadcasting via Indigenous Community Television (ICTV);[6] music development and recording; audio-visual

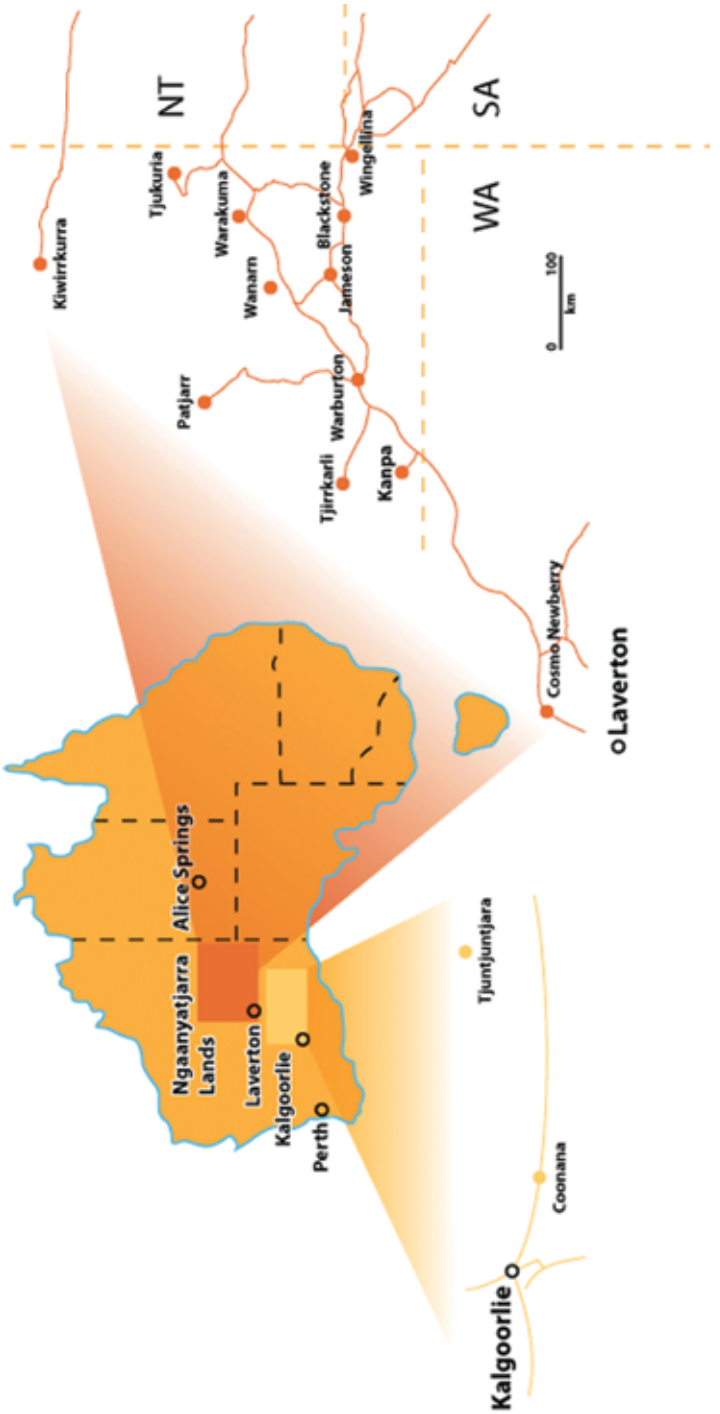

Figure 1: Map of the Yarnangu Lands (www.ngmedia.org.au n.d.; reproduced courtesy of Ngaanyatjarra Media)

archiving; IT training and support; technical services; and communications infrastructure and advocacy. I worked as Coordinator of Ngaanyatjarra Media from 2001 to 2010 with guidance from the strong Media Committee, including cultural officers Belle Davidson and Noeli Roberts. I worked collaboratively with Yarnangu in all aspects of planning, delivery and assessment of the programs described in this chapter. The research presented here was carried out while I was embedded within Ngaanyatjarra Media and actively coordinating these programs using a participatory action research methodology.

Yarnangu perspectives on ICTs

Far from living in 'cultural museums',[7] many people who live in remote communities are in touch with the global world and are quick to take up new technologies. In the Ngaanyatjarra Lands, many young people are now computer literate and are creating videos and slideshows, using internet banking, playing online games, downloading music, and setting up Facebook accounts to communicate and share photos. Yarnangu buy digital cameras, MP3 players, iPods, PlayStation games and mobile phones from their community stores, and save their photos and content created in the community media centre on their personal USB flash drives. Some Yarnangu even have home computers or laptops, and are connecting to the internet using the WiFi networks set up in all of their communities in 2009.[8] Globalisation has reached the Ngaanyatjarra Lands.

However, it is important to recognise the inherent cultural values embedded within any technology. For instance, the internet is based on the assumption that all information should be freely available to all people, the antithesis of Ngaanyatjarra culture in which knowledge is highly valued and selectively conveyed based on gender, age and cultural status. There are cross-cultural communication issues with internet technology, particularly the dominance of English-language text-based interfaces and training methods. This technology also assumes a certain type of usage and operating environment, as well as access to reliable power and networking.

For young people, the internet provides a portal to the outside world and addresses their curiosity about Western culture.[9] As they learn to use computers to access Western media and information, and increasingly aspire to a 'universalist youth culture' (Kral 2010:3), some senior Yarnangu are concerned that broadband and ICTs will reduce the importance of traditional knowledge and values for young people, and subvert the cultural authority of old people. The generational divide created by the rapid technological and ideological change is potentially a greater issue than the 'digital divide'. However, as Inge Kral (2009:5–6) observes, 'Aboriginal youth are now firmly part of the new "digital culture", but this participation has firm roots in a tradition of film and video culture that has been evolving in the remote regions over recent decades'. Its history of delivering cultural heritage media programs has therefore led

Ngaanyatjarra Media to take on the delivery of ICT programs to ensure community control and ownership over this process in an attempt to reduce the impact of the impending broadband network.

In preparing for the ITIC Symposium, on 2 July 2010, I spoke with three senior Yarnangu women who are local cultural leaders and teachers with Ngaanyatjarra Media associations: Minyma (Female) Chairperson Winnie Woods (WW), Minyma Cultural Officer Belle Davidson (BD) and the former Director of Ngaanyatjarra Education Area, Daisy Ward (DW). Each was very positive about the introduction of ICTs and community online media centres in the region. Winnie Woods started the conversation:

> WW: Before the media started, people never used to use computer. [Now] you can see all the people in the telecentre, playing different games all day, and it's not only in Irrunytju, it's out in all the communities…We like this computer, we like how the way it's going.
>
> DW: It makes things easier. Email, internet banking and so on.
>
> WW: Doing editing, website and recording…
>
> DW: Recording cultural trips. So the kids can see it, and learn from it.
>
> WW: And that's our work, we got to keep it strong.
>
> BD: And the people are getting very good at recording with the camera too, taking pictures. And I'm running around looking after them when they're taking pictures.
>
> WW: That's part of learning, taking law and culture TV, and bringing it home into Ngaanyatjarra Media and editing, put it into one piece, so that other people can watch it on the TV, on ICTV, and on computers over the Ngaanyatjarra Lands. And later, when we pass on, we want to see our young people running that job, on TV, computer, editing and broadcasting and all that.

These views are indicative of many Yarnangu across the region. Rather than seeing ICTs as a cultural threat, they are more commonly thought to provide opportunities for cultural regeneration, skills development, communication, access to local content and online services, and possible employment or economic reward. The rapid wave of technological change has overtaken debates over potential impacts, with broadband access, computers and digital technologies already part of daily life in many remote communities.

In the Ngaanyatjarra Lands the introduction of community access to ICTs has been a gradual and deliberate awareness-raising process guided by Yarnangu to ensure it is locally relevant and culturally appropriate. Taking an active part in the rollout of communications infrastructure has enabled Ngaanyatjarra Media to ensure that

broadband is accessible to the greater community, not only service providers and community staff.

Overcoming the 'digital divide' in the Ngaanyatjarra Lands

Communications are the lifeblood of Yarnangu society. They are crucial for maintaining links with family members and friends; informing people of news such as deaths, births, accidents, travel, cultural business and meetings; and discussing regional issues. While face-to-face communication is the preferred mode for Indigenous people, having access to appropriate facilities and equipment enables communication without the expense of acquiring and maintaining vehicles and travelling long distances on rough roads. However, the choice of contemporary communications technologies is not straightforward. What forms are appropriate for Yarnangu, who has access and at what cost?

The Ngaanyatjarra Lands have been one of the most communications-poor regions in Australia. The region relied on High Frequency (HF) Radio for its only telecommunications from the 1930s until around 1990, when the first telephony system was installed.[10] There was a lack of public or home telephones due to limited line availability in community exchanges. By the 1990s computers were increasingly being used by staff in community workplaces,[11] but there was a lack of access and training to support Yarnangu use and skills development, which created a localised 'digital divide'. Even when Telstra introduced two-way internet satellites in 2002/03 and upgraded the microwave telephony system to HCRC Swing in 2003,[12] there was still limited Yarnangu access to telephones and the internet. The two-way internet satellite was also over-subscribed and slow during peak usage times, with many high-end applications not working because of high latency, asymmetrical service and limited bandwidth.[13]

There was a growing need for a terrestrial broadband network in the region to avoid latency and the high cost of broadband satellite usage. In 2003 the Shire of Ngaanyatjarraku and the regional agencies Ngaanyatjarra Council, Ngaanyatjarra Health Service and Ngaanyatjarra Media teamed with the Western Australian Government to successfully apply for funding to establish a broadband network in the region known as the Ngaanyatjarra Lands Telecommunications Project (NLTP). By late 2007 a fibre optic cable network was rolled out to six communities in the region (Warburton, Warakurna, Wanarn, Blackstone, Jameson and Wingellina), with ADSL, Integrated Services Digital Network (ISDN) and Business Digital Subscriber Loop (BDSL, a Telstra product) becoming available at those sites. Ngaanyatjarra Media managed the second stage of the project, which was completed in early 2010, and installed broadband satellite in the six more remote communities of Cosmo Newberry, Kanpa, Tjukurla, Tjirrkarli, Kiwirrkurra and Patjarr, and a WiFi last-mile delivery with centralised content filtering in all 12 communities.[14] With this WiFi

rollout, Ngaanyatjarra Media sought to provide full-time shared access to broadband anywhere in the community, reducing the need for separate broadband services.

If the NLTP broadband was to benefit Yarnangu, understanding the potential benefits and pitfalls of this new technology would need to be developed along with appropriate facilities, skills and access to services. In 2003 Ngaanyatjarra Media outlined a program to establish community access facilities, regional networking, IT training and content, and awareness raising, for which it then sought funding. Fortunately, the sale of Telstra had led to increased government funding for IT programs. So with funding for remote broadcasting very limited, Ngaanyatjarra Media took the pragmatic decision to pursue this new funding for the provision of IT training and access programs.[15] By building on the community's ownership and engagement with media programs, and existing facilities in most communities, the ensuing shift in emphasis from radio and video production to IT and digital media led to a regional resurgence in media activity and an expanded role for Ngaanyatjarra Media.

Demand for community access facilities

Community demand for digital photography began in Irrunytju in early 2002 when Ngaanyatjarra Media purchased two one-megapixel digital cameras. Each day after school children would borrow the cameras to take photos around the community, and then crowd into the small media centre to view and print the photos they had shot. A dedicated computer was set up for the purpose, but the quantity of photographs and demand on staff office time became untenable. Combined with constant requests for viewing videos in the editing room and listening to music in the radio studios, it became apparent that the primary community demand of the media centres was for media consumption rather than production. Local broadcasting was not the answer.[16] People wanted interactivity, so they could choose their own programs. What was needed was a dedicated facility with multiple interactive terminals where community members could access their own program choices using computers networked to a shared media server.

Telecentres WA,[17] a Western Australian Government initiative to provide community access computers to regional centres, provided an initial solution. Telecentres WA received NTN funding to build robust telecentres or Modular Interactive Technology Environments (MITEs) for Indigenous communities and encouraged Ngaanyatjarra communities to apply. In 2003 Ngaanyatjarra Media successfully applied for a MITE in Irrunytju, which included eight access computers, a server and video-conferencing equipment, with an ongoing operational fund of $20 000 annually. This 20-tonne three-room transportable building, which was delivered and set up in early 2004, provided a pilot site for community access to computers, the internet and

self-paced training. Internet access was initially provided via a shared two-way satellite service,[18] and a single 128 kbps ISDN line was connected for video conferencing.[19]

The Irrunytju telecentre proved to be very popular. Since 2004 it has been constantly used by community members of all ages from Irrunytju and throughout the region. Ngaanyatjarra Media employed a full-time IT Trainer to work in the telecentre, deliver informal training, load local media content onto the server, develop training resources (including links to relevant online content) and provide technical support.[20] Yarnangu staff members were employed to help manage the facility and assist users with peer training. For Ngaanyatjarra Media, it was critical that the emphasis of the facility was on community ownership,[21] providing free access to community members, and enabling self-paced learning in a Yarnangu-friendly environment. This ensured that the building and the equipment were valued and looked after by the community.

Local ownership was achieved through having community photos on the screensavers, Ngaanyatjarra Media video productions and local music on the computers, Indigenous community websites bookmarked, and local drawings and photos displayed on the walls. iTunes was installed on all computers, with users quickly learning how to load music onto MP3 players.[22] Apart from local media, popular applications included internet banking,[23] card and online games, the Ara Irititja archive project, video conferencing, creating funeral and sporting events notices, newsletters, photoboards, GarageBand music recording, and media production tools.[24] With most people in the region speaking local Indigenous languages and often having low English literacy, we avoided text-based applications initially, opting instead for icon-based links, and audio-visual and interactive applications. The telecentre also provided a space for basic training in media production, and a pathway for Yarnangu to work with Ngaanyatjarra Media.[25]

The successful uptake of the Irrunytju telecentre led to Telecentres WA offering additional telecentres to the Warburton, Tjuntjuntjara and Warakurna communities. However, with demand for similar facilities from other communities in the region, Ngaanyatjarra Media sought to establish an alternative low-cost model to minimise operational and staffing costs, and to provide sustainable community access. It was decided that the best approach was to expand on the function of the existing community media centres where possible. However, most of these old buildings needed a lot of maintenance, as well as office furniture, computers, networking, phones, internet connections and more. This would not be easy to achieve, with funding programs providing only for training and support, and not for infrastructure, which required us to develop creative new funding strategies.

Regional IT training and community e-centres

Since 2004 Ngaanyatjarra Media has delivered ICT training to nearly 50 percent of the region's population through a range of programs: initially, under the First Click

program in 2004–05,[26] then under Future Skilling Outback (FSO) WA in 2006–07[27] and Backing Indigenous Ability (BIA) in 2008–09,[28] and, most recently, under the Indigenous Communications Program from 2010 until 2012. Based on lessons learned in the Irrunytju telecentre model, Ngaanyatjarra Media developed a training methodology that addressed local demand, was culturally appropriate, and sought to demonstrate how ICTs could be relevant and useful for Yarnangu.

Ngaanyatjarra Media's IT training approach included:

- one-on-one training and small group training in a familiar, friendly environment
- roving trainers (male and female teams where possible) for culturally appropriate gender-based training and more sustainable delivery[29]
- local Yarnangu co-trainers providing peer training in language where possible
- informal, practical (hands on), self-paced training
- non-accredited training to avoid formal training modes and text-based resources
- relating training to community life and events, workplace needs and interest, linking with existing community programs
- short achievable workshop modules designed to ensure participant success
- spending up to five days at each site to ensure people had time to come forward and be involved with regular repeat visits.

Initially there were no access computers in most communities. We began training in each community by having participants help in establishing a community access e-centre, mostly collocated with the media centres, where community members could access computers for training and ongoing use. Through the NLTP, Western Australian Government departments donated 69 second-hand PC computers, which enabled us to install up to four PCs at each site in addition to a Macintosh computer for media applications. Participants helped to clean, paint and furnish their media e-centres using donated materials, which built local ownership. We networked the computers to a server sharing access to music, photo and video content, and the internet where available.[30] In each community, local Yarnangu supervisors were trained and employed to assist with training,[31] manage their facility, provide ongoing support for community users between visits by roving trainers and report any technical problems via a helpdesk phone set up for regional support.

Initially, we focused the training on offline media applications using Mac-based iLife applications. People quickly progressed from taking and importing digital photographs to making slideshows in iPhoto, exporting these to iMovie, creating short movies and DVDs to view at home, and recording music using GarageBand as later discussed. People learned how to load music and photos onto personal MP3 players and iPods, and store their work on memory sticks.[32] We gradually introduced text with images to create photo-stories using Microsoft Word or Publisher documents for newsletters, posters and funeral notices; added stylised text and voice bubbles to

photos using Comic Life software; and used the interactive Ngaanyatjarra Language CD-ROM. The Ara Irititja digital archive computer was very popular with people of all ages, with its user-friendly language-based interface, vast collection of local heritage photographs and recordings, and annotations that users could contribute to.

Once internet access and issues were addressed, including managing download limits, content filtering and antivirus software, we introduced online applications including internet banking and web searching. Popular online applications included playing online games, watching video clips and YouTube videos, Google Earth, downloading music, looking at cars on the Trading Post, and exploring Aboriginal websites such as Deadly Mob, IndigiTUBE,[33] Us Mob and PY Media's website (www.waru.org).

In 2009 Ngaanyatjarra Media commissioned a regional website (www.ngurra.org) to provide a public face for communities from a Yarnangu perspective as later discussed. As part of regional IT training, participants contributed stories and photos to this website[34] and uploaded local music recordings onto the iTunes store and video productions onto YouTube. While email has not had high uptake, I discuss below how Facebook and social networking have recently become increasingly popular, particularly among adolescents.

Further funding programs such as BIA and the Indigenous Communications Program have enabled Ngaanyatjarra Media to upgrade the IT facilities in community media e-centres with new computers in each site, and to install colour laser printers and LCD monitors in larger sites. We also used funding to pay top-up wages to Yarnangu e-centre coordinators.[35] Additionally, after years of struggling with satellite internet services, or no internet in some sites, a shared broadband service was established in 12 communities in 2008–09, along with community-wide WiFi sharing.[36] This faster broadband speed has made internet usage a more pleasant activity, has enabled video streaming and YouTube viewing, and has allowed easier uploading of photographs to the Ngurra website.[37]

In order to better support media and communications programs, Ngaanyatjarra Media established the regional Ngaanyatjarra Media and Communications Centre in Irrunytju in late 2008. This building houses the upgraded and highly popular Irrunytju telecentre, and is a regional hub for coordination of training, broadcasting, resource production, local language media, online content, archiving and technical services, and community support.

Yarnangu use of telecentres and ICTs

The ongoing access to telecentres and e-centres has led to a majority of community members now having some level of IT skills and awareness, with IT usage increasingly becoming part of daily community life. On 23 September 2010 at the Irrunytju telecentre I conducted interviews with several of the telecentre users and Yarnangu

staff. Irrunytju telecentre supervisor Renita Roberts described the IT usage and her peer-training role:

> The computers are good for the kids to learn, play games, listen to music, and watch photos. They ask me [to] show them how to do internet games so I tell them and they do it with their hands. Sometimes they want to look at photos, I tell them go to this, do this. [Other applications include] internet, some kids learning how to use Facebook, email, photos, printing, I help them do laminating…I show them how to use internet banking or transfer money to other account so they can get money out if they got no keycard.

With a lack of books, library facilities or adult education programs in most remote communities, IT facilities provide a space for literacy development. An Irrunytju telecentre patron with low English literacy levels told me that using the internet had helped him learn how to type in English (Matthew, approximate age 22). Another patron described the applications he uses: 'In telecentre, I look at photos, games, Ara Irititja, old people photos, I add names. I look at games, use Google and Comic Life. I'm learning to type words' (Franklin, approximate age 20). According to another patron, use of the media applications in the telecentre can lead to employment in media production and broadcasting activities (Darrien, approximate age 35, interview with author, 23 September 2010). Another patron said, 'I use Ara Irititja, Facebook, internet banking, lots of things, do music on iTunes and make CDs and do radio broadcasting. Mostly I've been doing video and radio' (Franklin, approximate age 20). A young woman who had been living in Kalgoorlie prior to moving to Irrunytju commented that the telecentre users in Irrunytju were more competent with computers than her friends in Kalgoorlie, where the only accessible computers are in commercial internet cafes, with cost limiting use to 10–20 minutes (Naomi, age 17, interview with author, 23 September 2010).

Inge Kral (2010) describes the new-generation media centres as lifespan learning environments that enable young people to engage, develop skills, create media, and increasingly take on professional and leadership roles in their communities. Kral observed that 'competence is gained informally through observation, peer learning, trial and error, practice and interactions with non-Indigenous mentors' (Kral 2010:6). With reference to international research that locates the 'digital bedroom' as the most vibrant digital learning environment for youths, she describes the common situation for Yarnangu, with up to 20 people sharing a house and limited access to IT facilities or connectivity at home. In this case, community media centres have become the communal 'digital bedroom', providing IT facilities, relative privacy, and tools for media production and storage (Kral 2010:6).

When asked what community life would be like without the media centre, Renita Roberts replied, 'Sad one, there'd be nowhere to get learnt. They'd just sit around, play

cards, sit and watch videos and DVDs at home, might be more break-in and sniffing, ganga. Everyone wants the media' (interview with author, Irrunytju Community, 23 September 2010).

Key ICT applications

1. Ara Irititja Project

As discussed later in this book, the Ara Irititja archive project is a computer-based archive that was designed in the 1990s by Pitjantjatjara Council to provide Anangu, the Pitjantjatjara and Yankunytjatjara peoples, with access to the audio-visual recordings relating to their communities and families.[38] In short, it is the most enduringly popular application for Yarnangu as it contains a vast collection of locally relevant content about people, places and stories, and is user-friendly for people with low English literacy and has a well-designed interface that uses visual icons and local language. As Belle Davidson describes, 'The Ara Irititja is full of our family and our stories…It's a really important one for the children to grow up with their language' (pers. comm., Irrunytju Community, 29 July 2010).

Ngaanyatjarra Media set up an Ara Irititja computer at Irrunytju in 2002, which has had constant use since that time by people of all ages, but particularly by older people. Irrunytju users have been some of the most prolific contributors of annotations to the Ara Irititja database for names and information. Young people often help their parents or grandparents to use the archive, leading to cross-generational knowledge transfer.

In response to strong demand for the project to be extended to the Ngaanyatjarra communities[39] and to include more Ngaanyatjarra content, Ngaanyatjarra Media installed an Ara Irititja computer in six Ngaanyatjarra communities in 2009. A Ngaanyatjarra language interface and buttons were added to the project, with users able to select between the languages. A content collection project is currently underway for inclusion on the new browser-based version of the project.[40] The computers have had enthusiastic reception in the communities. A new generation browser-based version of the project is currently being developed.[41]

2. GarageBand music recording

GarageBand is the free Mac-based music recording software that comes with the iLife suite and is a user-friendly application used for local recording and music development. Ngaanyatjarra Media began conducting GarageBand recording workshops for community bands in late 2005, initially in five communities. After only a few days of training, the participants, mostly young fellas, were soon able to record and edit multi-track recordings, add effects to the vocals tracks and mix songs without the need of staff support. This simple, low-cost setup[42] proved to be a highly effective tool in

meeting a real demand by community members. It built on musical performance as an already popular activity and provided a tangible outcome, a recording on CD, to play at home or on community radio. Ngaanyatjarra Media went on to set up a Mac computer with the required ancillary equipment in six communities to enable bands to independently carry on with recording and music development. To date, hundreds of songs have been recorded and three compilation CDs have been produced and distributed with enthusiastic reception both in the Ngaanyatjarra Lands and further afield.[43]

Yarnangu have shown a definite affinity with the user-friendly Mac-based environment, and are able to navigate, record and save their songs, even with very limited literacy. Many of these young fellas attained only primary school level education, and were considered to have poor literacy skills and limited attention for learning. However, we observed them focused for many hours at a time on intricate multi-layered tasks, writing out lyrics, workshopping the scores, developing complex musical arrangements, recording tracks repeatedly until perfect, and refining the mix of the songs on the computer. There was a high level of peer training, experimentation with new styles and sounds, and self-sufficiency in working out how to achieve a desired effect using the software. Apart from the creative, musical and recording outcomes, Inge Kral (2008:12) identified significant learning outcomes from this process, including the development of IT competence, problem solving, concentration and refinement over extended periods, collaborative learning and skills sharing, and literacy development.

The musicians have begun making video clips of their songs, which are being broadcast on ICTV, with some now uploaded for viewing on YouTube. The music is also being broadcast on the regional radio network 5NPY and other networks across Australia, and there has been an increase in interest in radio broadcasting by the musicians themselves. The quality of the music has noticeably improved since the GarageBand recording began. The new Ngaanyatjarra Media and Communications Centre has a music-recording studio where the more experienced Yarnangu producers are now learning how to record using professional equipment and Pro Tools recording software. The first CD produced in the studio, *Turlku 4*, was released in 2010 and received rave reviews and airplay on the mainstream radio station Triple J.

The success of the GarageBand recording workshops and uptake by community bands has led to the establishment of a full-time music development program in the region from 2010 to 2012.[44] This program is building on the GarageBand model and aiming to get more women involved in music development and recording.

3. The Ngurra website

The word *ngurra* means ‘our home/land/country’. Ngaanyatjarra Media developed the Ngurra website to provide an online presence for Ngaanyatjarra people and communities, enabling Yarnangu to share information and images in their own voices.[45]

Yarnangu and community staff can log in and contribute content, including photos, videos, artworks, language content and community information. The website has been an ideal IT training tool,[46] with approximately 400 people in 12 communities being introduced to the website from 2008 to 2009, and about 200 people learning how to log on and upload content. While users enjoy viewing and making contributions with assistance from the IT trainer, to date there have not been many contributions made independently, primarily due to multiple steps in the process and slow upload times for photographs in communities still using satellite internet.

Ngaanyatjarra Media aims to develop the site to simplify the contribution process and to enable more language and multimedia content, such as short videos and music recordings and stories in both Ngaanyatjarra and English, and audio 'buttons' to hear pronunciations of Ngaanyatjarra words.

4. Facebook

Since 2010 Facebook has become one of the most popular applications for young people in the Ngaanyatjarra and the Anangu Pitjantjatjara Yankunytjatjara communities. Relatively few people have taken an interest in setting up email accounts, except to communicate with an employer or a non-Indigenous person. Yet the ability to create a personalised Facebook page and add photos with basic text has proven more attractive than contributing to a community website page.[47] In interviews conducted in Irrunytju telecentre on 23 September 2010, two Facebook users describe their experiences:

> I have sixty-one friends on Facebook, I tell stories to friends, send photos, they talk back, tell stories. I think Facebook is good to talk with people…friends in other places in Australia (Joanna, aged 16).
>
> I just muck around with computer, Facebook, make my own stories and photos for the family, make friends. I don't use email (Derek, approximate age 45).

IT trainer Chris McCullagh described the resultant literacy outcomes (interview with author, Irrunytju Community, 23 September 2010):

> It enables them to connect with their extended families further afield in Alice Springs or Kalgoorlie. There's been some positive impacts on the level of literacy because the relatives in town tend to converse in English. So for people in the communities to be able to converse with them, they're typing away in English all the time.

However, the advent of social networking is worrying some older people, as online communication effectively reduces the possibility of cultural supervision. Ngaanyatjarra Media chairperson Winnie Woods, an advocate of new technologies,

expressed concerns about the potential for a breakdown of kinship rules (pers. comm., Irrunytju Community, 29 July 2010): 'We don't want our kids getting learned about the Facebook and getting involved. They might get with the wrong woman or the wrong man.' It is fair to say, however, that concerns around young people engaging in online communications are not unique to Indigenous communities.

5. Video conferencing

Standard video conferencing facilities are well suited to Yarnangu communications as they enable face-to-face communication with a group of people present, interactions in local languages, and non-verbal communication such as body language and hand signs. Video conferencing also reduces the time, cost and risk of travel on unsealed roads to and from the Lands. ISDN-based video-conferencing facilities have been established at Irrunytju since 2002, and have been increasingly utilised since that time for link-ups with family members in correctional facilities[48] and hospitals. As described by telecentre supervisor Renita Roberts (interview with author, Irrunytju Community, 23 September 2010):

> In the media centre we got a video conference to look at family in prison or in hospital. People…go prison all the time. It's easy to visit from the video conference. They can visit sick people who are stuck in town. It makes them happy to see everybody. Mrs [X] had a big smile when she saw everybody.

For young fellas who are incarcerated in the Boulder or Perth prisons nearly 2000 kilometres away from home, video conferencing can provide the only means of family visits during long sentences and can reduce the risks of depression or self-harm.

Since the regional broadband network was installed in 2007, video-conferencing facilities have been set up in the three police stations for court hearings, in the shire meeting room in Warburton and in the regional training facility in Warakurna, and recently in several community clinics for tele-health purposes. As video conferencing is relatively simple and cheap, particularly using regional Internet Protocol (IP) networks, it is a very effective and appropriate communication tool for remote Aboriginal communities.

6. Other applications

Other applications that have proven popular are:

- Comic Life, which enables the arrangements of photographs in comic book shapes on a page and allows users to add text bubbles or colourful names or titles over the photos, which is an effective tool for introducing literacy and typing skills in a fun way

- Google Earth, which offers the ability to view country and topography from above, and provides Yarnangu with quick identification of landforms and Tjukurrpa tracks
- animation software, including Marvin avatar software, which is freely available to communities, as well as more user-friendly Anime Studio or iStopMotion software. Animation provides a tool for dealing with sensitive issues like domestic violence or substance abuse without identifying or shaming any individual.[49]

These are just some of the many applications that have been used as part of IT training in communities. They demonstrate that audio-visual production and interactive applications tend to be successful training tools.

Broadband access beyond centralised access centres

While media e-centres and telecentres are still the primary sites of internet access for Yarnangu, the reliance on these facilities for broadband access has begun to shift since the introduction of WiFi into Ngaanyatjarra communities. Access to personal digital media equipment by young people has increased in recent years, with MP3 players, digital cameras, audio recorders and mobile phones becoming more affordable and available in community stores. Also, the introduction of mobile telephony into the Warburton community in 2008 led to a rapid uptake of prepaid mobile phones. However, high call costs have resulted in mobiles being mostly used for incoming calls or as handheld media devices. In the communities without mobile coverage, many Yarnangu are using mobile phones to listen to music, take and share photos, and connect to the internet from home via WiFi.[50] WiFi has enabled online access where and when it suits the user, thereby creating new opportunities for culturally appropriate and private settings.

Although home computer uptake is still relatively low, affordability and flexibility of use without having to compete for community access computers is making them a more desirable asset. With cars currently the most valued commodity by Yarnangu, IT trainer Chris McCullagh predicts that computers will be the next big purchase (interview with author, 23 September 2010). Already, Yarnangu are beginning to obtain personal computers[51] or laptops for use at home, with cheap laptops now available in community stores. A former staff member told me of a Facebook chat she had with a young woman in Blackstone who she discovered was sitting at home using a personal laptop computer to communicate via the community WiFi. As with the majority of Yarnangu houses in the region, the house did not even have a telephone line.

Renita Roberts recently bought a laptop for $700 from the community store for her 11-year-old daughter: ‘She’s using it to play games, listening to music, doing all the stories on Facebook, doing it at home, connecting up to the WiFi. It’s got Westpac and all. It’s good to use on Christmas and holidays…when everything is closed, media,

and office' (interview with author, Irrunytju Community, 23 September 2010). Rennie et al. (2010) are currently undertaking a longitudinal research project in remote Northern Territory outstations to assess the relative benefits of community access online centres compared with shared wireless services for individual household access. They argue that the assumption of shared community access facilities like telecentres as the ideal model for remote communities needs to be tested (Rennie et al. 2010:65):

> Although some level of community ownership and organisation is desirable and necessary in the remote context, the question is whether this should always or generally provide the exclusive paradigm for access and use. Innovative models, such as that emerging in Wingellina and through the PY Ku network, demonstrate that the 'public' or community role might be better targeted at infrastructure and networks that reduce economic and technological barriers, leaving a space for individual and household use.

They conclude that while current community use occurs 'within the public domain of the community access centre', the 'inverse scenario, where connectivity is widely and publicly available, and use occurs according to the individual's need and location, may be key to overcoming the digital divide in the long term' (Rennie et al 2010:66).

Future uses of ICTs

Although it is still very early days, Yarnangu are enthusiastically using ICTs for learning, creating media, communicating, entertainment, and for accessing local media and digital archives.[52] The internet is becoming increasingly relevant for Yarnangu as it is populated with more relevant content and the tools for contributing content become more user-friendly.

As costs of services come down and higher bandwidth services become available, enabling delivery of high-speed traffic over a regional network, the potential applications for multimedia and interactive communications will open up: mobile Voice over Information Protocol (VoIP) telephony; IP video conferencing for e-health, meetings and training; regional IPTV networks enabling digital TV sets to connect to local broadcasting via WiFi; an online Ara Irititja archive database; and community uploading of videos for ICTV. Already there are local videos on IndigiTUBE,[53] and video clips by local bands and other productions on YouTube. Mobile telephones will be increasingly used for internet access, media creation and Bluetooth sharing, and using iPhone applications. More Indigenous-oriented social networking sites will hopefully be developed, as well as appropriate language-based online content and applications designed for remote Indigenous users.[54]

IT skills will lead to employment and e-commerce opportunities. Already, Yarnangu are increasingly participating in work that requires some computer usage

within regional service organisations and the community office, school, clinic, media centre or arts centre. E-commerce opportunities are also opening up, including online sales, cultural tourism and publishing, which is creating new opportunities for remote media organisations to distribute local music and video productions, publications and merchandise. The *Turlku 4* CD recordings were uploaded for sale on the iTunes store. Community art centres are using online sales and marketing, and local arts workers are learning to photograph and document artworks for online or gallery sales.

With digital media technologies now commonplace, the quantity of digital media content, including photos, music, videos and metadata, is increasing by the day. For Ngaanyatjarra Media, the need for effective processes for editing, archiving and redistributing the growing audio-visual collection has been a driver to become involved in promoting ICTs in communities.

With the advent of social networking and the relative ease of sharing digital media files, the risk of loss of cultural controls over media distribution has become a greater challenge. With cultural knowledge increasingly being documented for native title, mining and land management purposes,[55] there is an urgent need for effective tools for meta-tagging, management of intellectual property, and access restrictions over deceased content and sensitive cultural content.

Limitations and lessons learned

The Ngaanyatjarra experience has been successful in terms of engaging people, providing access to equipment and the internet, and developing meaningful activities. However, it is still early days in terms of meaningful and self-directed Yarnangu uptake of these technologies. While the introduction of broadband into the region and funding opportunities were external drivers, Ngaanyatjarra Media was cautious in introducing ICTs slowly, keeping infrastructure minimal to reduce risk, and allowing the demand from communities to drive the supply of equipment and training. Experiences from past programs in the region have shown that what is intended to be an asset can become a liability if its implementation is not properly planned and provisions put in place for ongoing training, support and maintenance programs. One-off programs are very rarely sustainable beyond the life of the funding program.

It is too early to assess the impact that the introduction of ICTs will have on the 'Closing the Gap' indicators for education, employment, health, life expectancy, housing and economic development that government now uses to determine program effectiveness in remote Indigenous communities. Indeed, it would be ambitious to suggest that Yarnangu uptake of ICTs alone will make a significant difference in any one of these areas for many years to come. Gado Alzouma (2005:339) refers to the unrealistic and 'technocentrist' expectation within parts of the international development community that equipping African people with computers will somehow

leapfrog them into the technological world of economic opportunities. Simply providing broadband, ICTs and training does not 'modernise' people or solve the digital divide. However, it can play a part in a broader process of overcoming inequity in development if it is in genuine response to needs identified by the recipients themselves and recognises their unique social and cultural worldviews and values.

It is assumed that ICTs will provide relevant applications to people's lives and that people will value them. All of these assumptions need to be tested to determine whether the rollout of ICTs is in fact more important, say, than a truck or tractor for the community. The key to this is community ownership in the program and involvement in decision making regarding its delivery.

Some questions that can help to identify the likelihood of a program's successful uptake and sustainability might include:

- Is this program a priority? Does it address an identified need or interest?
- Is there local ownership and involvement in the program delivery?
- Does the program link to an existing mode of communications practice?
- Is there an existing agency or facility to associate the program with?
- Is the program suitable for people with English as a secondary language and limited text-based literacy?
- Is the program sustainable beyond the funding program period? What ongoing training, support and maintenance are required?
- What resources are needed from the community for delivery? Are these available?
- Is the choice of technology, interface and applications robust, relevant and user-friendly?
- Is the project timetable realistic and flexible?
- Have cultural issues been identified and addressed?
- Does the program promote creation and use of local content and resources?
- What are the local indicators of program success?

This list is far from exhaustive but gives a suggested approach for development of remote delivery programs.

Conclusion

Ngaanyatjarra Media has worked closely with Yarnangu since 2004 to develop culturally appropriate models for introducing and engaging with ICTs. The success of the program is testament to the Yarnangu ownership in the process and heeding the lessons learned from previous programs in the region. The focus on audio-visual media-based applications and sharing of local content as a starting point has proven to be effective, with high uptake and transfer to more text-based applications like Microsoft Word and internet searching, and more advanced video and music production. While

it is clear that ICTs are now a part of daily community life for most Yarnangu, it is still early days in terms of future usage and applications of ICTs in a more self-directed way.

With ICT access now spreading beyond the controlled confines of media centres to home computers and mobile devices, there is an urgency to develop more Ngaanyatjarra online resources and applications to support language and cultural maintenance. If Indigenous people are to become producers and not just consumers of more Western content, recurrent ICT programs are needed to maintain community access facilities, provide ongoing training, and develop Indigenous online content and digital archives.

The level of uptake shows that the Ngaanyatjarra Media approach to ICT training and access is a workable model as a pilot for delivery in other remote Indigenous regions. However, the results of these ICT programs have not been compared in detail with alternative approaches or similar programs already carried out in other regions. There is a need for further longitudinal research to assess ongoing usage of ICTs by remote Indigenous people and to determine the long-term outcomes using not only government-determined indicators but also locally defined goals and indicators of success. By keeping to the core values of language and cultural maintenance, capacity building, and providing facilities for access and training in ICT use and production, Ngaanyatjarra Media is helping to build a community of savvy internet 'pro-sumers' who are beginning to use ICTs to 'fight fire with fire'.

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Notes

1. This report has been widely referenced and critiqued by academics ever since its publication, including Hodge 1990, Buchtmann 2000, Hinkson 2002 and Deger 2006.
2. The establishment of BRACS was a key recommendation of the Department of Aboriginal Affairs' report *Out of the Silent Land* (Willmot et al. 1984). BRACS was extended to 103 communities by 1996.
3. Adopted from a statement by Kurt Japanangka Granites in an early Warlpiri Media video (Michaels 1986:36).
4. 'Closing the Gap' is the current Australian Indigenous affairs policy slogan, seeking to reduce significant differences in life expectancy for Indigenous people, as well as indicators in health, education and housing.
5. These include the 12 Ngaanyatjarra communities plus Tjuntjuntjara and Coonana, in the Spinifex region to the south, and Mt Margaret near Laverton.
6. Ng Media was one of the founding members and contributors to the remote community content service ICTV in 2001, until its demise in 2007 when the government-funded National Indigenous Television (NITV) took over Channel 31, the Imparja satellite channel. ICTV returned in 2009 as a weekend broadcast on the Western Australian Government Westlink Channel 23, with Ng Media installing timed switchers for each community to receive the service. ICTV has recently been allocated a full-time channel on the Viewer Access Satellite Television (VAST) digital satellite, with transmission set to begin in late 2012.
7. Amanda Vanstone described remote communities as 'cultural museums' in 2005, a term adopted from the Bennelong Society (ABC Radio 2005).
8. Telstra sent out fliers to every household on the Lands to try to sell Asymmetric Digital Subscriber Line (ADSL) services, despite the fact that most Yarnangu households still do not have basic telephone services. Some households cannot even afford the new prepaid power cards needed for electricity to the house, opting instead to light a fire on the floor of the lounge room for light and warmth.

9. Very few Yarnangu actually aspire to leave their community to seek out this world.
10. The Digital Radio Concentrator (DRCS) microwave telephony system was installed in the late 1980s to replace the HF Radphone system, which was very popular with Yarnangu for communal conversations. It had a maximum line speed of 9.6 kilobits per second (kbps), which was not reliable for internet access. This had numerous problems. More remote sites had satellite telephony systems with a maximum speed of 2.4 kbps.
11. Mostly using offline applications such as dial-up internet access, which was very slow and unreliable, on DRCS. Only schools and some clinics had satellite internet prior to 2002.
12. The Higher Capacity Radio Concentrator (HCRC) Swing system enabled more reliable line speeds of up to 19.2 kbps.
13. Delay time between data transfer 'handshakes' owing to distance from satellite.
14. Using a Cisco router to link all internet traffic via Domain Name System (DNS) server site OpenDNS
15. IT programs included Networking the Nation (NTN), Telecommunications Action Plan for Remote Indigenous Communities (TAPRIC), Backing Indigenous Ability (BIA) and Telecentres WA. Funding for IT programs was not included in the Indigenous Broadcasting Program funding for the sector. The review of the Indigenous Broadcasting Program funding by the Department of Communications, Information Technology and the Arts (DCITA) in 2006 led to a restriction for radio production and broadcasting only, ending support for community video production, the primary media form for Ng Media, PY Media and Warlpiri Media.
16. The model of media consumption that the BRACS program and facilities had been designed around.
17. Telecentres WA, now called the Community Resource Centre Network, managed through the Western Australian Department of Regional Development and Lands, began in 1993 as a pilot project called WA Link (through the federally funded Telecentres Project) to provide community IT facilities in regional towns. This was expanded to remote communities under the NTN funding program.
18. With 1 gigabyte (GB) monthly download limit.
19. The 1 GB limit was soon being exceeded, leading to a download usage chart being put on the wall and internet being disconnected for the month once the limit was reached.
20. Due to the focus on IT training, a full-time non-Indigenous coordinator/trainer was employed to manage the telecentre and deliver training. This required a full-time wage, housing and on-costs. Ng Media supplemented the $20 000 per annum operational funding from Telecentres WA with IT training funds and generated income from sales of CDs, videos and other merchandise through the centre. While funding for operational costs of telecentres has increased slightly, it is still not sufficient for full-time staff costs.
21. Not providing government services, as per other community online access centre models.

22. MP3 players became available in stores from about 2004–05. This sharing of music raises issues around copyright, especially for the local bands who are trying to make money through sales of CDs, providing an opportunity for trainers to explain about copyright and intellectual property.
23. Another driver was the need for internet banking. From 2003 Community Development Employment Project (CDEP) wages and Centrelink payments, previously paid as cash, were paid directly into bank accounts. The need for internet banking training and computer access was critical to reduce automatic teller machine (ATM) costs, empower Yarnangu and reduce demands on staff.
24. We supplemented the personal computers (PCs) with a Macintosh computer for music listening using iTunes and for the Ara Irititja Project, a highly popular regional archive project developed by Pitjantjatjara Council. Another Macintosh was later set up in the back room for music recording using GarageBand software (part of the iLife suite). While Macs tend to be more intuitive and user-friendly to navigate, and contain cross-compatible media production and viewing software, people quickly became familiar with both PCs and Macs without any real issue.
25. With the convergence of media and ICTs towards multimedia and multi-platform delivery, most media production was now being done on computers, primarily Macintosh computers using iLife software.
26. A program funded through the Western Australian Department of Education and Training.
27. FSO WA was coordinated by the Western Australian Department of Local Government and Regional Development, with funding originally provided by DCITA. Ng Media delivered basic IT training to more than 530 people and basic technical training to 60 people in 16 communities over 18 months in the region under this project.
28. This training stream was offered by contract.
29. Trainers were recruited based on experience working with remote Indigenous people, English as a Second Language training skills and cultural awareness, more than IT skills. Relationships were the key to success.
30. This was mostly via satellite prior to NLTP, with some communities providing a spare Telstra two-way satellite service for the purpose.
31. Paid under the CDEP scheme and with top-up wages from program funding where available.
32. More recently, mobile phones have also been used for storing, playing and sharing photos, music and videos.
33. Deadly Mob was developed by the Gap Youth Centre as part of a roving program to communities teaching media and IT skills and loading stories to the website. IndigiTUBE is a joint Indigenous Remote Communications Association and ICTV website for radio and video content produced by remote Indigenous media practitioners.
34. Due to the design of the Content Management System, uploading of photos and stories is not very user-friendly, limiting the ability of participants to do this task independently.

35. Under the FSO and BIA programs. Since completion of BIA, the payment of basic wages for media centre supervisors has been shifted to the National Jobs Package but no top-up wages are available.
36. Thanks to the NLTP project, six communities have BDSL broadband and six have broadband satellite service.
37. According to IT trainer Chris McCullagh, in sites with satellite internet the slow speed in uploading images to the website led to disengagement for training participants (interview with author, 23 September 2010).
38. The original model is built on a user-friendly, standalone Mac-based platform using FileMaker Pro software specially adapted to meet the unique needs of the project. The software design and template have been used in many other regions around Australia to develop other archive projects. The project is designed with a Pitjantjatjara language interface and visual icons, more than 90 000 annotated photographs, audio recordings (with written language and translations), films and videos, written documents and artworks with records dating back to the 1800s. Annotations can be added or corrected by community users, and images or recordings of deceased persons or sensitive content can be blocked from viewing.
39. With strong regional and family ties between Ngaanyatjarra and Anangu Pitjantjatjara Yankunytjatjara Lands, there was already significant Ngaanyatjarra content. Building the Ngaanyatjarra collection was a natural extension of the project.
40. This project was done in conjunction with a language recording project funded by the Department of the Environment, Water, Heritage and the Arts (DEWHA), with oral history life stories, Tjukurrpa (Dreaming stories), Turlku (traditional dance and singing) and children's stories recorded and transcribed for inclusion on the archive.
41. The updated browser-style Ara Irititja interface, due for release in late 2012, will be more interactive with added functionality, including genealogy and family tree information, maps and ability for users to directly record audio and video commentary and information about entries, reducing the need for written literacy. This will give users more control of the growth of information at a grassroots level and promote the use of language.
42. Setup only requires a Mac computer, small audio mixer, USB keyboard, microphone and headphones, in addition to guitars (supplied by band). Percussion sounds can be achieved using the keyboard and the sound module in GarageBand.
43. The CDs produced using GarageBand are the compilation CDs *Turlku 2* and *3* and the Irrunytju-based Alunytjuru Band album *Wati Kutju (One Man)*.
44. With funding from three sources — DEWHA, Country Arts WA, and the Western Australian Department of Culture and the Arts.
45. Tabs include Tjukurrpa and history, local services, work programs, arts and crafts and other local activities, and visitor information.
46. The site enabled us to develop web awareness in users, as well as build on written text and computer literacy.

47. The website training introduced the concept of uploading stories and photos.
48. Prisons are located at Alice Springs (700 kilometres form Irrunytju), Boulder (1200 kilometres away) and Perth (1800 kilometres away).
49. Pintupi Anmatyerr Warlpiri (PAW) Media recently made an excellent animation series, visually recreating Tjukurrpa stories and animating oral histories in humorous ways.
50. The mobile phones are purchased and used when travelling to Warburton or distant towns or cities to maintain communication with family back in the community.
51. Schools and community offices often give away second-hand computers to community members.
52. As demonstrated at the ITIC Symposium, the role and potential of ICTs for supporting cultural and language maintenance will continue to expand.
53. The IndigiTUBE website (www.indigitube.com.au) has constant radio streaming of remote radio networks, including 5NPY, as well as videos by remote Indigenous producers available to view.
54. This is a key development area for Ng Media.
55. Using Global Positioning Systems (GPSs) for site surveys, tracking/monitoring tools such as iTracker, and Geographic Information Systems for embedding layers of meta-data and cultural information onto maps.

Chapter 3

The acquisition of media as cultural practice: Remote Indigenous youth and new digital technologies

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Abstract: *Globally, telecommunications, information technologies and traditional broadcast media have converged into a digital realm. In remote Indigenous Australia, with improved broadband and greater access to mobile telephony and digital technologies through media organisations, arts projects and libraries, young people are appropriating new digital technologies for their own socio-cultural processes and purposes. In the remote context, the affordances of digital technology are enabling individual and collective access and participation, the acquisition of expertise, and the enhanced capacity for computer-mediated communication and multimodal production outside institutional or instructional settings. The manner in which young people are taking up digital technology reveals much about the way in which their imaginative capacities are being moulded by them and how this technology is being used as a cultural tool. In this chapter, a 'practice' perspective is taken from anthropology to highlight how the digital media practices of Indigenous youth in some communities are drawn from the established practices of the older generation, who, from the 1970s, participated in remote Indigenous media organisations and used earlier pre-digital media forms as tools for language and culture maintenance.*

Introduction

All over the world digital technologies are transforming contemporary culture, and remote Indigenous Australia is no exception. The AIATSIS Information Technologies and Indigenous Communities (ITIC) Symposium held in July 2010 confirms the growing use of digital media in diverse and creative ways to support innovation, employment, training and governance, as well as the production, maintenance and

transmission of culture through programs and initiatives in education, language, health and wellbeing, local and national digital archiving repositories, and the burgeoning creative industries and broadcasting sectors (AIATSIS 2010). Significantly, the ITIC Symposium foregrounded the capacity for information technology (IT) to engage young people, particularly in creative media, thereby providing new platforms for formal and informal training, employment and enterprise generation. This aspect is the focus of this chapter.

Globally, the nature of education, employment and everyday life is being transformed by digital technology. Concordantly, in remote Indigenous Australia it is commonly assumed that, concurrent with the provision of computer hardware and internet access, a corresponding set of IT practices will emerge that will bridge the digital divide, improve socio-economic outcomes and assist in 'closing the gap'. In this discussion I concentrate primarily on settings in Central Australia where Indigenous people have a history of access to, and participation in, local Indigenous media organisations. The current youth generation has thus witnessed their elders using earlier pre-digital media forms as 'tools for cultural maintenance' (Daniel Featherstone, interview with author, April 13 2008) over a number of decades. Accordingly, I argue that the current wave of youth media production has firm roots in an evolving tradition of film, video and music production. I contend that the acquisition of media as cultural practice is 'processual' (Ortner 2006:9) and has been evolving intergenerationally. Moreover, I propose that information and communication technology (ICT) skills are being enhanced and elaborated through the affordances of, and access to, digital technologies in community-based digital learning environments.

Youth learning project

In the following discussion I draw primarily on data from a three-year Australian Research Council (ARC) funded project, and build on insights gleaned from more than 20 years of observations in formal and informal learning contexts in remote Indigenous Australia.[1] This ARC research project explored the many ways in which Indigenous youths aged 16 to 25 are extending their learning, and expanding their language and multimodal literacy practices by embracing digital culture. Research has taken place in media organisations, youth centres, arts projects and libraries in remote communities in the Northern Territory and Western Australia, all of which have tapped into digital technology as a way of engaging young people in meaningful, productive activity, skills development and arts practice, as well as diverting them from substance abuse.[2]

A collaborative ethnographic research methodology was used to document the modes of representation and communication that Indigenous youth are drawing on in these non-formal, community-based learning contexts. Findings indicate that learning is most effectively fostered through interest-driven engagement in projects and activities

that matter to young people. Through engagement in socio-culturally meaningful projects, young people are gaining access to digital resources. As a consequence, youth in remote communities, even those with minimal formal education, are acquiring technological expertise through engaging in new forms of media production and multimodal expression, often culminating in opportunities for enterprise generation and employment (Kral 2010; Kral and Schwab 2012).

History of media in remote Aboriginal Australia

The late 1970s saw the inception of the Australian Labor Government policy of Indigenous self-determination, coupled with a growing national interest in Indigenous arts and the profiling of Indigenous identity through music, performance and media. In remote Australia a so-called 'telecommunications revolution' (Hinkson 2005) ensued after the 1979 launch of the Central Australian Aboriginal Media Association (CAAMA) in Alice Springs, and the 1985 launch of the national AUSSAT satellite system. Through AUSSAT, many remote Indigenous communities were able to access broadcast television and radio for the first time. Suddenly, remote Indigenous people started moving from a pre-television world — where communication was still based substantially on face-to-face interaction utilising a rich multimodal oral and gestural repertoire (Michaels 1986) with minimal communications technology — to sudden, intensive exposure to broadcast television and an increasingly Westernised lifestyle.

The proposed launch of AUSSAT and the introduction of TV was seen by anthropologist Eric Michaels as a challenge to Indigenous language and culture (Michaels 1986), and Aboriginal people feared that their language and culture would be lost.[3] These concerns drove initiatives at Yuendumu, a Warlpiri community in the Northern Territory, and Ernabella, a Pitjantjatjara community in north-east South Australia, where the Warlpiri Media Association, now Pintupi Anmatyerr Warlpiri (PAW) Media, and Ernabella Video and TV (EVTV) were established as local low-powered, unlicensed TV stations between 1982 and 1986.[4]

In 1987 the former Broadcasting for Remote Aboriginal Communities Scheme (BRACS) was implemented. BRACS represented a federal government response to the perceived threat to Indigenous languages and culture that was posed by the launch of AUSSAT (Deger 2006:3–4). Through BRACS, equipment and training were provided for the production and local broadcast of radio and video services now being beamed from AUSSAT. Between 1987 and 1996 BRACS was launched in 103 remote communities, giving those communities a choice over the channels to turn on: local BRACS media or introduced mainstream television. Irrunytju Media, now Ngaanyatjarra Media, was established in 1992 at Wingellina, a Ngaanyatjarra and Pitjantjatjara community in Western Australia, as one of the later BRACS initiatives.

Thus, since the mid-1980s remote Indigenous media organisations have been responsible for training and promoting language, culture, music and stories through

analogue video, radio, and multimedia production and broadcasting. In 1998 the first of the now annual, national Indigenous remote media festivals was held at Yuendumu, followed in 2001 by the establishment of Indigenous Community Television (ICTV) by the Remote Indigenous Media Organisations (RIMOs) at the third Remote Video Festival (Rennie and Featherstone 2008). Significantly, the establishment of ICTV in 2001 coincided with the arrival of digital technologies in some remote communities in the early 2000s.[5]

The arrival of digital technologies

Worldwide, the past decade has seen the rapid development of new ICTs, an increase in affordable small mobile technologies, and the penetration of the internet and mobile telephony (Alzouma 2005). New digital technologies started appearing in remote communities in Central Australia around 2004. Simultaneously, ICTV began mirroring this increased access to digital technology. By 2006 a resurgence of remote community video production was palpable, particularly among the youth generation, which was discovering newly introduced digital media applications. ICTV was now being transmitted to some 150 remote communities and eight to 12 hours of new content was being generated from communities per week, with 80 percent of that content in Indigenous languages.[6] With ICTV:

> people were suddenly watching their own films on television alongside films from other communities and seeing family and friends from half the country away and more. And it was this fantastic networking and communication and suddenly with that feedback loop which video-making hadn't had up until that point much. Suddenly people saw the reason for video and really took to it and wanted to make films and were coming up with really creative ideas…It suddenly meant something to make video. Whereas before ICTV it might have been screened at movie nights or sent away or taken with you, but it wasn't *en masse* communication and validation of what you were doing as well. People were calling other people up: 'Oh I saw you on television!'…So along with that came this massive boost in interest for video production in communities. (Anna Cadden, media trainer, interview with author, 19 March 2009)

In July 2007, with the re-allocation of the ICTV Channel 31 to NITV, the newly established predominantly English-language National Indigenous Television network, ICTV was left without a satellite channel. This effectively turned off ICTV to all of the remote communities accessing it and contributing local productions. Following a two-year hiatus, a reduced ICTV service returned. Now, in a manner similar to fears generated by the advent of satellite technology in the 1980s, concerns are being

expressed regarding the impact of the switchover to the potentially monocultural/monolingual format of 'Direct to Home' Digital TV (IRCA 2010).

In summary, the early BRACS initiatives represented local productions, local messages, and local ownership and dissemination where people were telling their own stories and documenting local narratives. At that time, people's exposure to media was coupled not only with the opportunity to consume Western media, but also to create media that reflected their own worldviews. Subsequently, ICTV represented another successful model of non-market media production by building on the local, where people, and especially young people, in remote communities were both the producers and the audience (Jason Gibson, Media Trainer, NT Library, pers. comm., 20 June 2009). Now telecommunications, information technology and traditional broadcast media have converged into a digital realm and become embedded in small, accessible mobile technologies. As a consequence, new social practices have emerged, with young people appropriating new digital technologies for their own socio-cultural processes and purposes (Kral 2010, 2012).

Access and the digital divide

In remote locations, improved broadband and mobile telephony is slowly being rolled out (Featherstone 2011; Rennie et al. 2010), principally, to meet national government aims for equity in ICT training, and public access to online resources and services for improved educational, health and economic outcomes for Indigenous people in remote regions.[7] While some regions are now networked, the large majority of Indigenous people in remote communities still have limited access to broadband or computer facilities and training (IRCA 2010). Census data have been used to determine household access to ICTs in remote contexts, leading researchers (Daly 2005; Radoll 2006) to conclude that Indigenous people in remote communities have restricted access and opportunity to explore and develop ICT competencies. This lack of access 'represents a huge disadvantage, and an inability to participate in the creative economy', revealing that for many there is 'still a long way to go in overcoming the digital divide' (IRCA 2010:56).

While inequities in community and/or household-based access and participation are clearly evident, 'collective models of access' (Alzouma 2005) or 'public access' (Rennie et al. 2010) have been developed in accordance with broadband, satellite or WiFi availability (IRCA 2010:67). Significantly, youth in many remote communities now have access to media and computer-based resources during the non-school hours through media centres or telecentres, youth centres or arts programs.[8] As Daniel Featherstone (IRCA 2010:67) describes:

> In some areas, telecentres or community media centres are providing a range of activities and training tools to encourage broader community access and usage

> of facilities. By building community ownership and having enough applications (radio studio, video production, digital camera, on-line computers, media viewing/ listening, archive computer, music recording setup, printer, teleconferencing etc), the facility becomes a significant part of the community…

In these locations, young people are commonly progressing from basic IT experimentation with Mac-based iLife applications, including iMovie, iPhoto and GarageBand, to video editing and DVD production, and music recording and CD production (Kral 2010). Here, skills are attained through individual experimentation, peer learning and teaching, or occasional workshops with mentor experts.

International research on youth media practice commonly locates the 'digital bedroom' as one of the most vibrant kinds of digital learning spaces for youth (Jones, R 2010; Livingstone 2002; Sefton-Green 2006). Here, adolescents in advanced industrialised economies can be found 'hanging out, messing around and geeking out' (Ito et al. 2010) with computers, alone or in small friendship networks, in the privacy of their bedrooms. However, as noted above, access to computers or the internet at home is often not possible in remote communities. Therefore, access to what are termed the 'new generation media centres' (IRCA 2010:59) provides an important collective learning environment for young people to engage, develop skills, create media and, increasingly, take on professional and leadership roles in their communities (IRCA 2010:67):

> Community media centres are providing a Lifespan learning space in remote communities where there is little engagement in formal education and training. It is a space where remote Indigenous people are interacting on an equal basis with media professionals, without any power differential. It engages all generations in technologically competent tasks of creative cultural production intended for use by the community.

Moreover, in these spaces 'there is no right or wrong way' for learning or participation and everybody is '*set up to succeed*' (IRCA 2010:67–8; italics in original).

The Indigenous Libraries and Knowledge Centres (LKCs) of the Northern Territory Library are an additional access site in some Northern Territory communities. LKCs combine traditional library services with electronic resources and new media tools. A 'focal point' of this initiative is the Ara Irititja digital archiving software, which is found in public access locations in the Pitjantjatjara and some Ngaanyatjarra communities (Hughes and Dallwitz 2007) and rebranded by Northern Territory Library as the Our Story database (Gibson et al. 2011:153). Here, young people with computer and media skills take responsibility for archiving and documenting local community knowledge in databases of heritage materials. In this database, repatriated

items are enriched with annotations and new material is included through the use of digital media technologies (Gibson 2007).

Informal learning spaces such as media centres, youth centres and libraries thus play a role as *communal* digital bedrooms (Kral 2010). In these locations, young people experience 'ownership, belonging, and control' (Heath and Street 2008:5). Featherstone (2011) suggests that with limited access to IT facilities or connectivity at home, such locations provide facilities, relative privacy and tools for media production and storage. They are spaces that nurture what youth media worker Shane White from Lajamanu (pers. comm., 22 June 2010) terms 'learning by mucking around':

> For young Aboriginal media workers like us media is fun and we also learn new things as we are making videos. At the BRACS room where we work, we have keys to go in anytime to use the video camera, people trust us so we have control in the work we do.

This highlights the importance of community-based, non-formal or 'out-of-school' (Hull and Schultz 2002) sites and spaces for the acquisition of media as cultural practice, especially when computer and internet access is not possible in the home.

As I have described elsewhere (Kral 2010), in tandem with these collective models of access, mobile phones, digital cameras, MP3 players, Touch iPods and even laptop computers have become affordable. This has placed smaller mobile technologies in the hands of Indigenous people, and predominantly young people under 25. Consequently, in media centres, LKCs and even at home, the internet is being accessed for social networking, messaging and uploading locally produced films and photos through sites such as YouTube and Facebook, while computers are used to play music, burn CDs from iTunes, and download music onto MP3 players. Even in sites with no mobile phone or WiFi coverage, there is high uptake of mobile phones for use as media creation or storage tools, for sharing content via Bluetooth and as identity markers. The control of technology has thus shifted away from institutional locations or non-Indigenous authorities, and young people are now initiating productive activity in ways that were previously unimaginable. Digital technology is thus firmly part of people's everyday lives.

The affordances of new digital technologies

This draws our attention to what writers have termed the 'affordances' or perceived properties, limitations and possibilities of new communication technologies (Gershon 2010a; Hutchby 2001; Pfaffenberger 1992). As Bryan Pfaffenberger (1992:511) suggests, '[n]ew resources are unlikely to be ignored if they can be woven into an existing or new activity system…to fulfil an essentially expressive function'. In the remote context, the affordances of digital technology include individual and collective

access and participation, the acquisition of expertise, and the enhanced capacity for computer-mediated communication and multimodal production outside institutional or instructional settings. This is enabling the agentive participation of young people in global youth culture.

The acquisition of expertise

One affordance of digital technology is the potential for collective and individual acquisition of expertise. In community-based learning environments, competence is gained informally through observation, peer learning and teaching, fearless trial and error experimentation, and practice alongside access to mentors at pinpoint moments (Kral 2010). What we are seeing here is young people's rapid adaptation to new learning contexts, with learners voluntarily determining that they will become experts in highly technical fields of knowledge. Young people's adaptive learning strategies, evident in new media participation and production, reveal a tendency towards audio-visual and icon-based navigation in tandem with multimodal rather than text-based applications. Simultaneously, through regular interactions with affordable small media devices, young people are becoming fearless of technology, and even those with low levels of literacy are quickly able to grasp the intuitive problem-solving logic of digital cameras and MP3 players and transfer this logic to computers and editing software like iMovie, Final Cut or GarageBand. Individuals are in control of the technology and it is this control factor that is allowing expertise to develop and productive processes to take place.

Multimodal possibilities

The world of communication has changed dramatically and is changing still as a consequence of the arrival of digital technologies (Kress 2010). An affordance of this change is the emergence of new forms of computer-mediated communication and the increasing prevalence of *multimodal literacies* that draw on a variety of modalities including speech, writing, image, gesture and sound (Hull and Nelson 2005).

Multimodality is now a given in 'new media studies' (Kress 2010; Thurlow and Mroczek 2011). However, in the desert region of Central Australia, Aboriginal people have for thousands of years used a complex of multimodal communication forms and semiotic systems to convey meaning through language, sign, gesture and gaze; special speech styles and registers; non-verbal communication; and the iconic representations found in body painting, carved designs and sand drawings. These relevant meaning-making systems have been deployed in the manipulation of these symbols and resources over generations, and are now manifest in the current wave of youth multimedia productions (Green 2009; Kral 2012).

Indigenous youths are using digital technologies in the maintenance of social relationships and the generation of new cultural products. New forms of textual communication and linguistic creativity are emerging. The creative, icon-based

approach embedded in the Mac iLife suite of applications lends itself to a rich layering of image, sound, text and symbols. With access to resources and regular practice, young people are constructing and framing multimodal texts using intertextual layering of image, text, song and gesture. In media centres and LKCs, and even in homes in communities with mobile phone or WiFi internet access, youths are uploading personal profiles, photos and films; using text and symbols in inventive ways; and writing, usually in English, about themselves and to each other. Thus, through Facebook and mobile phone text messaging, they are maintaining sociality while taking 'delight in the generativity of texting conventions' and the 'infectious new forms' of textual play that these channels enable (Jones, G and Schieffelin 2009:1058). Simultaneously, young people are stretching the boundaries of what is possible, including transferring mobile phone photos and film to Facebook, reformatting films to Bluetooth between mobile phones, and dragging sound files from digital heritage archives onto MP3 players (Jason Gibson, pers. comm., 20 March 2008).

A further affordance of digital technologies and software is that they lend themselves to 'visual/spatial thinking' (Pfaffenberger 1992:508). This is evident in the spatially oriented and icon-based structure of applications like GarageBand and Facebook. The symbolic conventions used in these applications enable users, who previously would have avoided text-only procedures, to interpret, read and manipulate technology in socially relevant ways. In other words, young people are elaborating the spatial and symbolic dimensions of familiar communication modes and adapting them to new media activities. This is allowing, as linguist Charles Goodwin (2000:1490) suggests, embodied actions to be 'assembled and understood through a process in which different kinds of sign phenomena', instantiated in 'diverse media' or 'semiotic fields', can be 'juxtaposed in a way that enables them to mutually elaborate each other'.

International studies (Crystal 2008; Hull 2003; Hull and Stornaiuolo 2010; Kress 2010; Soep 2006) suggest that fresh thinking about literacy has been ushered in by the arrival of digital technologies and the emergence of new social practices surrounding electronic media, digital film/photography and mobile phones:

> This is a new youth culture that thrives on metalinguistic awareness and creative experimentation with multiple orthographic systems and representational resources in electronic communication. Included in this culture are youth who are expressing their hybrid linguistic and cultural identities in wholly new codes. (Lam 2008:308)

This new approach allows us to reframe what is meant by literacy in a globalised world increasingly 'filled with digital artefacts and multiple modes and media available for communication across multiple symbolic systems' (Stornaiuolo et al. 2009:384). It also calls into question the deficit framework for assessing literacy competence among Indigenous youths in remote contexts so commonly found in media and public policy discourse.

In summary, where young people have access to digital technologies, they are voluntarily engaging in self-directed learning and acquiring expertise. Thus we are beginning to see how digital technology is transforming modes of oral and written communication, and enhancing the potential for new forms of multimodal cultural production and communication.

From the local to the global

A final affordance is that digital communications are expanding the modes and channels by which young people especially are extending their social networks in the 'cultural flow' between the local and the global (Appadurai 1996). Despite the short history of engagement with the Western world and a cultural predisposition to focus on local or parochial matters, contemporary Indigenous youth culture is extending out to the global in a manner previously not possible. New technologies are enabling young people's agentive participation in global youth culture. In this way, they are transforming their visibility by positioning themselves as active members not only of the local, but also the global, community.

> Come and listen to our stories. Spend some time to listen and we'll work together. We can show people of the world what Australia means. The [problem] that we really need to handle in this country is that people [are] not really working together. We have an opportunity to tell the world using this media. (Shane White and Maxwell Tasman, youth media workers, pers. comm., 10 August 2009)

Until recently, productions were predominantly for a local audience. Now, wider viewings of films at festivals, on ICTV and through uploads to YouTube reach out to a global audience. Online social networking through Facebook has gained popularity principally because it operates as a highly visual form of localised, parochial and socially meaningful interaction. However, an additional affordance of this form of communication and information sharing is that it connects the local with the global. Social networking is encouraging Indigenous youth to extend their sociality beyond kin and same age peers to a broader network, irrespective of age, race, gender or class. In fact, young people appear unfazed by new forms of social interaction with older Aboriginal and non-Aboriginal artists, academics, professionals or even organisations. Facebook is also leading to greater reflexivity in the youth generation, allowing them to hyperlink with local, national and global issues as both viewers and participants. Examples such as this indicate that young people want to author a new narrative, one that differs from that of the older generation, and thus have their worldview validated in the public space. Such aspects are demonstrated in the recent exploration of the implications of Facebook in the remote context in the film *Mamu*, made by Martu youth media worker Curtis Taylor in response to ideas he encountered at the ITIC Symposium in Canberra in July 2010.[9]

The acquisition of media as cultural practice

'Just like the old people, we are dreaming. We have a new dream with technology' (Curtis Taylor, youth media worker, Martu Media, ITIC Symposium, 15 July 2010).

Finally, I want to return to the fears expressed in the 1980s that satellite-delivered television and other communication services would be a threat to Indigenous language and culture. In 1994 Eric Michaels emphasised that in the Warlpiri context, 'it is the *practices* of cultural production that are essential' (italics in original), and he urged that if 'by the next generation the means of representing and reproducing cultural forms are appropriated and lost, then all is destroyed' (Michaels 1994:119).

I suggest that the generative principles of creative social and cultural reproduction have not been lost. Rather, they are clearly represented in the media activities of the current youth generation, primarily, that is, in locations where young people have access to new media resources. The manner in which young people are taking up digital technologies reveals much about the way in which their imaginative capacities are being moulded by them and how this technology is being used as a cultural tool. What we are seeing here is what Sneath et al. (2009:18) term the '*generative capacity*' (italics in original) of these tools to enable users to experiment with language and new forms and to layer symbolic structuring. Young people's innovation, technological competence and capacity to manipulate multiple symbol systems — that is, Indigenous knowledge systems and the symbols of contemporary youth culture intertwined with a variety of modalities including alphabetic text — are allowing them to imagine and create new ways of 'being' as expressed through art, song, film and other multimodal productions. In this scenario, to draw on Tim Ingold (2000), knowledge is not only being transmitted but also regenerated within the context of people's practical engagement, experience and performance of tasks in dynamic and changing local environments.

In this chapter I have concentrated primarily on Warlpiri, Ngaanyatjarra and Pitjantjatjara settings in Central Australia. In these locations the everyday social practices of the current youth generation are drawn from myriad intercultural influences. Connection to kin and country, and the enduring relationship between place and identity, remain strong. For some young adults, the first contact their parents had with the Western world was in the 1960s, so for them the past is close. Young people are choosing to participate in media activities because the cultural production roles are in the domains of knowledge that matter to them — culture, arts, country and new technologies, all within a framework of social relatedness:

> [T]he actual consequence of the introduction of new technology is that young people are developing technological competence using the new digital tools and using this to re-engage with language and culture. They are developing a role as mediators between old people and applying current technologies to preserve

> culture and build social capital for the future. They are choosing to become the new generation of storytellers, and are gaining status and recognition within their own community and the outside community. (IRCA 2010:57)

Where activities are tied to meaningful community projects, we are seeing youth engaging as the mediators and facilitators of multimodal productions in collaborative, intergenerational activities that positively affirm their contemporary hybrid identity. Representations of local identity, local knowledge and local cultural production can be found in music, film and heritage archiving activities:

> Music is our way to give a strong message…looking after our sacred areas and waterholes and grandfathers' land, that's a strong message, like so younger generation can see that, and listen to that, and understand what the message is. (Chris Reid and Nathan Brown, musicians, Wingellina, 22 July 2009)

In media productions, young people are borrowing or 'styling' (Hill 1999:543) global cultural and linguistic resources, but also layering these onto traditional modes and speech styles. Thus their cultural products are often redolent of a cultural schema that marks them as particularly Ngaanyatjarra, Warlpiri, Pitjantjatjara and so forth (Kral 2010). Most noticeably, youth media work is being validated by elders who need young people to mediate between old knowledge and new technologies. Simultaneously, young people are engaging in language and culture maintenance activities as the facilitators of digital media. In this way, we are witnessing new forms of intergenerational knowledge transfer through media:

> Old people are singing the stories telling the story about our self and this country. Now we're telling a story through media that should be the way to go. Through using media is somehow a connection to the community and I find it connects to the whole world. (Maxwell Tasman, youth media worker, Lajamanu, 10 August 2009)

I thus suggest that in certain contexts young adults are becoming the self-appointed definers of new forms of cultural competence, primarily in locations where they have access to digital resources and technologies that enable new forms of media production and the composition of multimodal texts. Here, young people are rapidly claiming new cultural forms and modes, and adapting them for their own purposes, thereby revealing much about their capacity for adaptation and change, and symbol system production and interpretation. In this way, the current youth generation represents what the future holds, rather than their parents or grandparents. As the facilitators of new digital practices, young people are modelling the future. From this perspective,

they are providing new models for each other and for the children who will follow in their footsteps.

Intergenerational transmission of media as cultural practice

Thus far I have highlighted the important role that media organisations have played in remote Australian Indigenous communities. In this section I elaborate on the formative influence that these organisations have had on the new generation of youth media workers. Maxwell Tasman from Lajamanu states that 'our generation we live with new media' (pers. comm., 10 August 2009). Yet he also recalls the important experience of viewing the Warlpiri Media video production *Bush Mechanics* (Warlpiri Media Association 2001) while at boarding school in Darwin. The film showcased Warlpiri people and Warlpiri language and Tasman remembers how 'proud' he felt. Likewise, Shane White (pers. comm., 10 August 2009) remembers watching 'this new channel ICTV':

> The first time I saw ICTV I was glued to the TV. It was something new. I liked most of the videos and it made me want to make some videos for my community. Without ICTV I would've been working somewhere different. So ICTV was important for us.

I have also noted how access to digital resources and technologies in community-based settings is enabling new forms of media production and the composition of multimodal texts. Accordingly, I contend that where youth are most adroit at developing meaningful applications for new media technologies is in communities where concomitantly they have observed an earlier model of media communications made by local people for a local audience. In these instances there has been the intergenerational transmission of the *practice* of using media technologies as a tool for language and culture maintenance. Here, also, young people have access to resources to engage in meaningful social and cultural practice. Significantly in these locations, young people tend to interact with the artefacts of digital technology as cultural forms rather than as ICT tools for bridging the digital divide.

By taking a 'practice' perspective from anthropology, what we are seeing here is the 'playing out of effects of culturally organised practices' where the media practices of these young people, and 'the articulation of those practices with larger events in the world', is 'processual' (Ortner 2006:9) and draws on culturally relevant observation, learning, practice and, hence, cultural 're'-production and transformation. As Barbara Rogoff (1990:198) states:

> Individuals transform culture as they appropriate its practices, carrying them forward to the next generation in altered form to fit the needs of their particular

> generation and circumstances. The shifts in societal practices over decades and centuries result from the transformation of institutions and technologies to fit current needs.

In the remote Indigenous context, the manner in which young people are taking up new digital media practices has been informed by old media practices. This represents a process of what Bolter and Grusin (1999) term 'remediation'; that is, 'the process by which people's understandings and experiences of one medium are intertwined with those of other media' (Gershon 2010b:393). In other words, some young people have acquired what can be termed 'ambient' media practices as taken-for-granted cultural practice from their elders,[10] thus echoing the manner in which children are socialised into literacy practices through exposure to 'ambient' literacy practices, activities and knowledge in the literate home or community environment (see Ferreiro and Teberosky 1982; Schieffelin and Gilmore 1986).

In conclusion, intergenerational transmission of ambient media practice has impacted on the acquisition of media as a cultural practice among some of the youth generation *when and where* young people have also had access to digital technologies. By comparison, in locations that do not have a history of locally oriented media production and broadcasting, the introduction of digital technology often remains oriented around an instructional model of ICT training aimed at bridging the digital divide and enhancing employment possibilities and online service provision. In such locations there is generally little or no modelling of the creative potential embedded in digital technologies. Consequently, interest in digital technologies may wane and tends not to lead to independent engagement, the acquisition of technological expertise, or the generation of locally oriented cultural production and multimodal literacies.

Conclusion

In this chapter I have proposed that the acquisition of media as cultural practice in remote Australia has been evolving over a number of decades and is now being enhanced and elaborated through the affordances of and access to digital communicative technologies. The current wave of youth media production has firm roots in old media traditions and many young people have imbibed, using media forms as tools for cultural maintenance as taken-for-granted cultural practice. Through observing the practices of their elders, these processes have enabled the acquisition of technological skills and ICT competencies.

According to visual anthropologist Faye Ginsburg (2008), accounts of digital media in academic or popular culture discourse rarely include Indigenous communities. In fact, there has been little significant investigation of the implications of the introduction of digital technologies in remote Indigenous Australia, and few ethnographic studies on how ICTs are being used (see Brady 2007; Daly 2007; Dyson and Brady 2010).

Furthermore, ethnographic studies of digital media rarely take account of Indigenous youth. In fact, ethnographic research on many aspects of youth cultural practice is 'surprisingly scarce' (Bucholtz 2002:526). Yet as Mary Bucholtz (2002:526) states, anthropology is 'well-situated' to offer an account of how youth in different socio-cultural contexts 'produce and negotiate cultural forms'. This assertion notwithstanding, youth and digital media have been the subject of substantial international ethnographic inquiry (Hull 2003; Ito et al. 2010; Osgerby 2004). However, studies have generally been limited to industrialised nations (Coleman 2010).

With the convergence of media and ICTs, increased government support for public internet access in remote communities, the rollout of the National Broadband Network and mobile telephony usage in remote communities, the development of digital heritage archives and community access databases, and the change to digital TV, new opportunities and challenges are opening up. Yet we know little about the implications of these changes for Indigenous people in remote Australian communities.

Detailed ethnographic investigation is therefore required to understand how remote Indigenous people are acquiring and using new digital technologies as cultural practice and for what purposes. We have much to learn about the manner in which Indigenous youth are taking up new technologies: how and in what contexts such practices are being acquired, and how computer-mediated communications are being used. Such research will have implications for the rollout of the National Broadband Network, mobile telephony, digital television and the growth of digital archives. In addition, further research on lifespan learning in cultural sites beyond school, and the implications for multimodal literacy development, will provide innovative new approaches to language and literacy research. This knowledge will provide much-needed information on models and practices that will enable Indigenous youth to expand their multimodal communicative repertoires and their technological competence. A comprehensive understanding of these processes will lead to the development of a social theory of learning beyond school, and increased understanding of adaptive learning and the voluntary acquisition of expertise in non-mainstream settings. Lastly, such information will inform the provision of more effective services for improving IT readiness and bridging the digital divide in remote Indigenous regions.

Acknowledgments

This research was funded by an ARC Linkage Project (LP0774918) and the Fred Hollows Foundation. In addition, considerable in-kind support was received from the Northern Territory Library, Ngaanyatjarra Media (Aboriginal Corporation), Warlpiri Education and Training Trust, Warlpiri IK Youth Development Aboriginal Corporation, Djilpin Arts Aboriginal Corporation, and Ngapartji Ngapartji Intergenerational Language and Arts Project. A version of this paper appeared first at

the ITIC Symposium (a presentation planned in collaboration with Shane White and Maxwell Tasman, youth media workers from Lajamanu Community, Northern Territory). The granting of an Australian Academy of the Humanities ISL-HCA International Research Fellowship allowed me to present an elaborated version of the paper at the American Anthropological Association 2010 Annual Meeting, New Orleans, Louisiana (Panel: Changing Channels: Trans-cultural circulations and transitions of televisual media).

Generous comments over the years from colleagues, especially media workers Daniel Featherstone, Jason Gibson and Anna Cadden and literacy researchers Shirley Brice Heath and Jerry Schwab, have helped to form and develop the ideas in this chapter. I am indebted to these colleagues for many of the insights and connections drawn from our conversations. I also thank all the Indigenous people and organisations who have supported my research over many years. Finally, I would like to thank all the youth media workers who have shared so many of their ideas, thoughts, reflections and aspirations, in particular Shane White, Maxwell Tasman, Chris Reid, Natalie O'Toole, Revonna Urban, Jasmine Lawson and Curtis Taylor.

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Notes

1. Inge Kral was a Postdoctoral Fellow on an ARC Linkage Project (LP0774918) between the Centre for Aboriginal Economic Policy Research (Australian National University) and the Fred Hollows Foundation, *Lifespan Learning and Literacy for Young Adults in Remote Indigenous Communities* (2007–2010), along with Dr RG Schwab (Chief Investigator).
2. Sites include Ngaanyatjarra Media (Wingellina and Blackstone, Western Australia), Northern Territory Library (Lajamanu and Ti Tree, Northern Territory), Ngapartji Ngapartji Intergenerational Language and Arts Project (Alice Springs, Northern Territory), Djilpin Arts (Beswick, Northern Territory) and Warlpiri Youth Development Aboriginal Corporation (Yuendumu, Willowra, Nyirripi and Lajamanu, Northern Territory).
3. Ara Irititja database annotation: m 1090–3.
4. Remote Indigenous media organisations in other regions include Top End Aboriginal Bush Broadcasting Association and Pilbara and Kimberley Aboriginal Media.
5. This section draws on 'Indigenous community television' (Featherstone and Roberts 2007) and an interview with Daniel Featherstone, 13 April 2008.
6. Featherstone and Roberts 2007 and interview with Daniel Featherstone, 13 April 2008.
7. Government initiatives designed to alleviate the digital divide include Networking the Nation; Telecommunications Action Plan for Remote Indigenous Communities (TAPRIC); Closing the Gap: National Partnership Agreement on Remote Indigenous Public Internet Access; and the current Indigenous Communications Program (see the 'Indigenous Communications Program' page on the Department of Broadband, Communications and the Digital Economy website at <www.dbcde.gov.au/icp>). See also the Community Technology Centres Association website at <www.ctca.net.au> for initiatives in New South Wales.
8. Programs have included 'Deadly Mob', Out Bush and Gap Youth Centre, Alice Springs; CAAMA Youth Media project; Ngapartji Ngapartji Intergenerational Arts Project (Alice Springs, Docker River and the Anangu Pitjantjatjara Yankunytjatjara

(APY) Lands); Carclew Youth Arts APY Lands Project; Warburton Youth Arts Project, Ngaanyatjarra Lands, Western Australia; Warlpiri Youth Development Aboriginal Corporation (Yuendumu, Willowra, Nyirripi and Lajamanu); the Central Australian Youth Link-Up Service (CAYLUS) youth programs (Papunya, Kintore and Docker River); and the Martu Media youth media project, Parnngurr, Western Australia.

9. See *Mamu: A director's vision* (CuriousWorks 2011).
10. With thanks to Bambi Schieffelin (pers. comm., 12 November 2010), who made the connection between young people's acquisition of ambient media practice and children's ambient literacy acquisition.

Chapter 4

Training for inclusion

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Abstract: *There have been many programs initiated in Australia to train Aboriginal students for inclusion in the information technology (IT) sector. These range from Microsoft Unlimited Potential courses, which mainly focus on preparation for office work, to Online Analytical Processing games, which involve students in discovery learning about how computers function. We suggest that this latter approach has much more useful ramifications for Indigenous people in terms of engaging them in employment and education. Years of research into Aboriginal and Torres Strait Islander education recommend that education in this sector should focus on practical, discovery learning with cultural and personal relevance, and stress the importance of identity within an Indigenous cultural context.*

Introduction

The differences between Aboriginal and Western belief systems are many, and influence the knowledge that is valued and taught through each, as well as the way each teaches. For instance, we need to consider the significance of spiritual concerns and general wellbeing in learning, as well as the need for relevance to the learner and his or her culture (Kutay 2010). The approach to Indigenous learning should focus on practical discovery with opportunity for cultural and personal relevance in learning (e.g. Harris 1990; Nicholls et al. 1996). Another important element is the need for greater respect for the learner as knowledge holder. Such programs must acknowledge the learner's existence within a social context, and his or her relation to the broader historical, social and political issues (Wall 2006).

Indigenous educational research recommends a focus on practical, discovery learning (Nakata 2002) with opportunity for cultural and personal relevance in learning (Harris 1990; Nicholls et al. 1996). Other research has focused on self and identity in learning, and how this greatly influences students' outcomes (Mooney and Craven 2006; Willmot 2010).

IT provides an opportunity to develop online materials that support culturally relevant and personalised learning. However, little of this has been aimed at Indigenous users to date. One focus of research into e-learning is to provide appropriate frameworks for learning that support educators in developing online learning courses. These frameworks make it easy to design learning environments and include learning materials, while retaining the flexibility for materials to be tailored to different learners, teachers and technology (for example, in how different users access the internet). The federal Vocational Education and Training (VET) sector has designed the Flexible Learning Toolbox as a collection of online learning materials. This 'toolbox' approach provides a consistent, standard interface for experienced teachers to use as a framework for sharing their ideas on training. However, it is often used merely as a means of 'putting lectures online'.

Indigenous toolboxes

VET Indigenous toolboxes tend to comprise individual Flash-based creations for each topic a course covers. They move away from the standard toolbox approach of supporting the mirrored learning resources across many courses, and instead focus more on materials of Indigenous cultural relevance.

An important aspect retained in the Indigenous toolboxes, however, is that they allow content to be gathered together in a way that allows learners to navigate materials in their own time and order, and to revise and make sense of material through their own learning processes. They also provide a vibrant interface for sharing multimedia learning examples, such as scenarios in Flash or video to support role playing and experiential learning. These toolboxes also include a teaching guide to support learning.

Relevant cultural content holds priority over the flexibility of being able to offer mirrored learning resources across courses, yet each toolbox normally deals with one theme or course. So in order to create similar courses using the same interface, but with content that is relevant to differing Indigenous peoples in different locations, the Flash system can be linked to a database and each set of material redeveloped for each new location or theme. An alternative approach would be to design more flexible Web 2.0 interfaces to the material, and this chapter considers this latter option.

Access to online material

Although our work focuses on web learning, we have found that many rural and semi-remote communities do not have access to the materials we are developing due to lack of affordable or public internet connections. Also, many urban Indigenous households rely on internet cafes for access. As is common across all areas of Indigenous affairs, we can never deal with one issue in isolation, and in this instance we cannot solve the issue of culturally appropriate learning if there is no access to the new digital tools that enable this.

Students are increasingly using mobile phones to access learning material, such as podcasts, and to provide feedback and discussion through mobile uploads (Dyson et al. 2009). In addition to mobile services, we recommend providing more opportunity for people in remote areas to collect and manipulate multimedia resources on computer. Although mobile services are ideal for the collection of information, the formation of knowledge and the linking of information to provide relevant contexts for learning require more substantial web access.

As well as involving remote communities in the collection of materials, we need to acknowledge that local knowledge is needed to transform this into learning materials. The bird posters in languages developed at Charles Darwin University (CDU 2010), which collect knowledge that identifies wildlife in regional Australian languages, are a good example of what can be done with resources. We envisage that such information could be collected online for other language groups, which would increase access for those users to the design, printing and distribution of such resources.

The Bundjalung people around Washpool National Park are the owners of knowledge about the rare flora and fauna of that area (of which there has been little documentation). We are keen to provide resources for the local school and community to be involved in a similar project, but presently there is little internet access in this community, which lies only one-and-a-half hours by road from Grafton. We are working with the North Coast Computers Project, a project with Northern Rivers TAFE,[1] to install e-hubs with training courses, and TAFE staff members are trying to obtain funding to extend local primary school access and enable access within the community.

Sharing learning

Although there has been much study of the learning preferences of Indigenous students, there has not been much guidance developed from this for their instructors. When developing materials for the engagement and immersion of Indigenous students, we have turned to an area of educational research called Problem Based Learning (PBL), which is designed to support Indigenous teaching and learning approaches.

Although developed for differing educational needs, the aims of PBL mesh with those of Indigenous learning (Kutay and Mooney 2008) — for instance, the emphasis on group work, the immersive nature of the learning and the learning structure through which knowledge is taught at different stages as students become ready to learn. As part of the process of integrating PBL and Indigenous Australian Studies, a website has been developed to collect resources for transformative teaching in Indigenous education. While focusing on Indigenous studies, this process of presenting alternative views and questioning established views could work across many disciplines.

Significant preparation is required to teach using a PBL method. PBL courses have been developed for school students and for use at universities (generally for professional courses), where it is acknowledged that students will face 'problems' in their careers. By developing sites such as the Indigenous Australian Studies site,[2] we hope other teachers will share their ideas. These could be made available privately, with access granted only to registered members, or as a public resource. Private sharing of material is often preferred by the author, as many of these teaching materials are not highly self-explanatory and require background resources.

Many online groups are managed through email lists, shared sites and social networking software, but these are not familiar to many Indigenous internet users. Yet resources such as these can be valuable for training. First, involvement in these networks provides a motivation for their members to learn about shared tools and, second, only those with a known interest in the identified common domain, and hence with some background experience of working in Indigenous education, will access the network. This provides for a website that is well trusted and allows more open sharing of resources.

Stories are knowledge repositories

To convey Aboriginal knowledge to non-Aboriginal students would be invalid without the contributions of Indigenous students and staff through the 'translation' of their experiences into this new intercultural context (Ramsey and Walker 2010). In particular, we need to reverse the present 'systemic undervaluing of local knowledge and Aboriginal culture, a deeply ingrained unwillingness to "see" more sophisticated Aboriginal knowledge and processes' (Yunkaporta 2009:105).

Battiste (2002) argues that animating the voices and experiences of Aboriginal people and integrating them into mainstream education creates a balanced centre from which to analyse European culture and learning. Therefore, we are using online teaching using storytelling (see also the Australian Learning & Teaching Council's Indigenous Teaching at Australian Universities website[3]).

These narratives form an effective way to teach other students (Andrews et al. 2010; Blakesley 2010; Egan 1998) and respect traditional storytelling methods (Bradley 2010). Furthermore, Aboriginal students will be able to verify that their

work is part of an ongoing course online. This is a way of acquiring students' expert knowledge for teaching others, and it also holds benefits in validating their knowledge and identity (Mooney and Craven 2006; Willmot 2010).

Around Australia many people are developing cultural awareness training that is tailored to the needs of their communities. This covers a wide range of issues, experiences and priorities for learning. It is, in fact, this great variety of experiences that makes cultural awareness training so hard to define, as there is no 'one' Indigenous Australian culture. However, many people in the Indigenous community hold vivid experiences that describe aspects of cross-cultural conflict or issues for cultural awareness that could be shared. The benefits of including more people in this training include enhanced respect for the storyteller and value for the cultural heritage of Australia.

A range of software services is now used for sharing knowledge online and for supporting the uploading and sharing of text, images and audio-visual material. We are redesigning one of these services to be used for sharing stories, preferably in audio and video formats. One website that we have designed is an online cultural training course, which illustrates such a framework for sharing stories (Kutay et al. 2011). The design of this story-sharing-for-learning web service is a meld of the Interactive Ochre National Vocational eLearning Strategy toolbox[4] and a face-to-face workshop in cultural training. The live workshop was video recorded, and images from the workshop and other video segments were used to create the online interface. Experiential learning scenarios, similar to those available in the Interactive Ochre course, will be made available using a database of different people's stories. When this database is well populated, trainers can then select the stories relevant to the ones they wish to present.

Storytelling for learning

The types of services and functionality that users have access to on websites are always changing, and the latest move is towards what are called Web 2.0 services. The purpose of developing a Web 2.0 style of interface is to allow many users to upload stories to provide a 'community narrative' on the issue to be studied. This approach to information gathering is cognate with the traditional storytelling of Aboriginal peoples (Attwood 1988; Magowan 2001).

Many people are sceptical of this approach and contend that conflict could arise from having multiple authors. Research into this issue suggests that these conflicts tend to arise when stories are gathered without recognition of variation in context, such as when stories from different locations and types of historical interaction with white settlers are combined as one experience of colonisation (Finlayson 1999; Minoru 2002).

Further, this process of collecting a group story, rather than simply publishing individual stories, is a necessary result of the cultural restrictions on people's authority to tell a story. Following the traditional form of storytelling, Aboriginal people still

acknowledge that you can only tell your own story, and not that of others. Even if you have heard a story, you need authority to speak for it before you can 'tell' it (Kutay and Ho 2009).

The power of this process is seen in the development of the story of the Stolen Generations. When children were removed from their families, the parents and children affected all had stories, and feelings of guilt and neglect. Social and geographical barriers prevented them from meeting to combine their stories, and it was only with the advent of the Link Up search network of family records that their stories also linked up, and that the real historical reasons and consequences of this period in Australian history became known outside Aboriginal communities (Attwood 2001).

Creating Web 2.0 training sites

We have developed a cultural learning site for the Clarence River history (Kutay and Mundine 2010) and Kutay is working on a similar site for teaching kinship (Kutay et al. 2011). In developing a cross-cultural awareness tool for students and government workers, we are providing support for two types of learning. Aboriginal and non-Aboriginal students learn from different cultural materials and use these materials in quite different ways. We consider this training to be a two-step process that will use Indigenous students and staff to teach non-Indigenous students.

We have designed the initial interface for the cross-cultural training website. It is based on the original structure of a face-to-face workshop. In this format, Indigenous students are presented with an overview of their own culture, and how it works in the context of mainstream Australian society. At significant points in this framework students can add comments on how aspects of their cultures have affected their experiences of mainstream society.

Recording these experiences will form the group story in an audio, and possibly video, repository. Students can also hear other students' experiences, and consider their common and distinct features. Contributing their stories also recognises the significance of each student's experience as part of the group story, with each in the role of teacher to peers. This opportunity to teach is also an effective and efficient way for the students to acquire expert knowledge and understanding of a subject, rather than simply learning another's interpretation (Grzega and Schöner 2008). The process of teaching necessitates that students construct their own ideas into coherent 'stories'. Through the learning methods preferred by Aboriginal people, speaking a story can also form an experiential means of learning, and singing a traditional story is considered the ultimate way of knowing (Bradley 2010).

Previously, such exchanges of experiences have been on an informal basis at workshops, so it will be interesting if this process is transferred to the computer, thereby becoming part of a permanent record or repository. The authors of the stories in the repository will select the access level for their own contributions, and the context in which they are relevant within the workshop. A single user may fill the workshop with

his or her stories, or may wish to simply add his or her own stories to others. The final site with these individual stories added then becomes the group story. Trainers can select the stories they feel are relevant to their particular presentation of the cultural issues from among those stories to which they have access.

The site with this selection of stories will be available as part of cross-cultural training workshops to tackle prejudice through education. Non-Indigenous students can use the interface in addition to the workshop, with stories linked to workshop themes. They will be exposed to ways in which Indigenous cultures differ from their own culture, including areas where conflict has arisen and where harm has been caused through misunderstanding.

The stories that each student finds on the interface at each point during the workshop will depend on three functions. First, stories relevant to that theme and to the point being covered in the workshop are searched in the repository. Second, students select a 'role', such as taking an Aboriginal approach to the experiences, or a work area, such as 'legal'. This will limit the items searched to match these 'tags'. Third, they will undertake workshops under the instruction of an Indigenous trainer who has selected a subset of the stories considered most relevant. This learning process will provide students with some idea of the background of their future Indigenous clients, co-workers and friends, and why other people's reactions to events may not be the same.

Storytelling wiki

Another approach to providing online learning resources is to use open-source wiki systems, like MediaWiki,[5] that were specifically designed for sharing and linking information. We are modifying a wiki service to use audio and video content in a more accessible format for learning. As a first example of this, we designed a website for teaching the history of the Clarence River area. This site (Kutay and Mundine 2010) is a resource for government workers to learn about the area, as well as for the community to share stories. Most importantly, much of the work going into the development of this site is to provide a resource that can be reused in many different contexts for story sharing.

A similar system has been developed to share stories about locations destroyed in the Afghanistan War. Virtual Campfire (Cao et al. 2010) is a mashup of many services that provide a system of tools to link video, audio and text files to form a story line. A mashup is a collection of software services that are linked together. In this system the services allow users to create, search and share multimedia artefacts and connect heterogeneous data sources. Virtual Campfire provides communities with a set of components for Context-Aware Services as interface to each component and Multimedia Processor Components (Figure 1) to tag and connect items. Users can create separate communities for their projects on the server. For example, in one

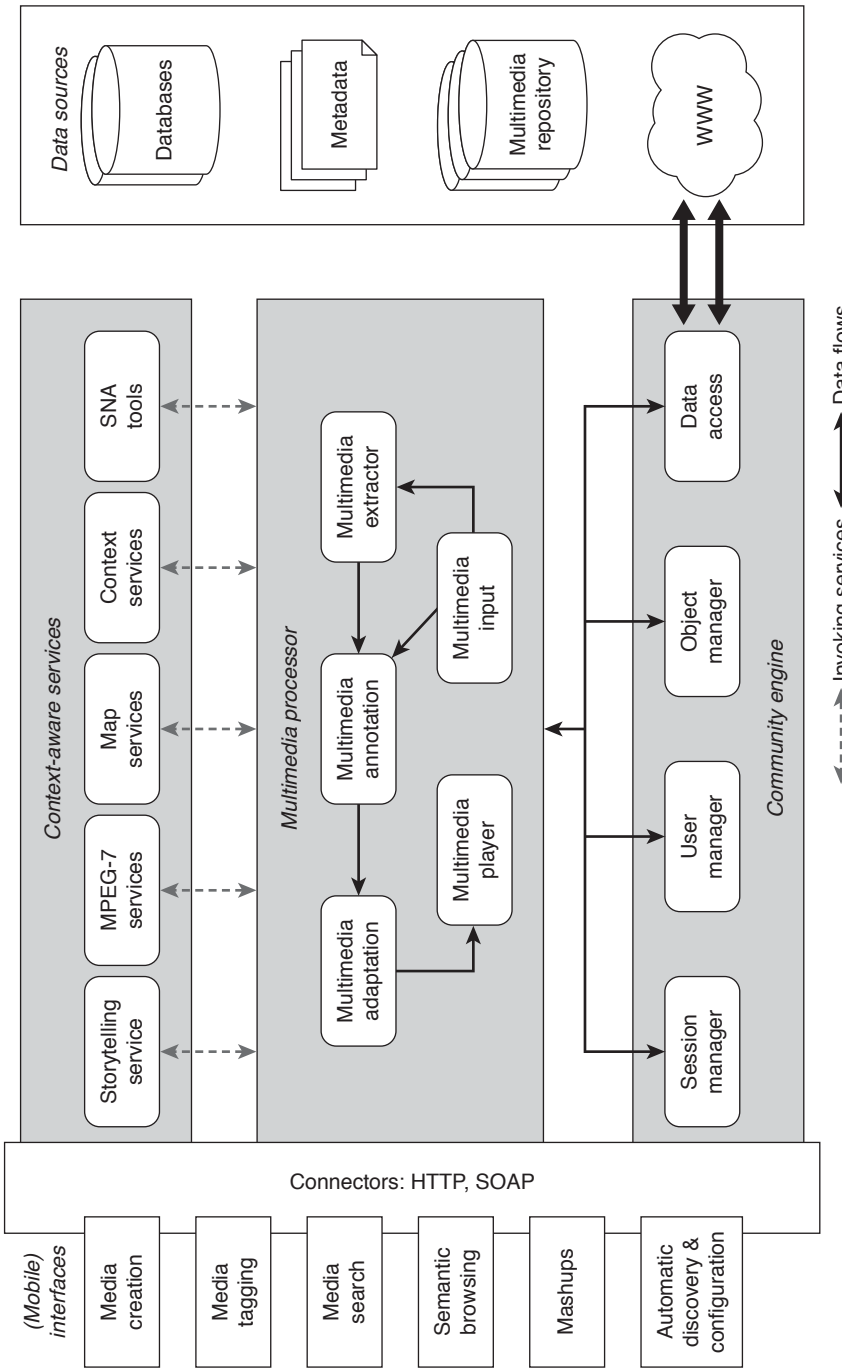

Figure 1: Virtual Campfire System showing separate components for multimedia handling. For more details see Cao et al. 2010 and video trailer[6]

project, a three-dimensional map of a building destroyed by war is located on Google Earth, and tools are provided to link audio and video stories to locations on the model.

The Clarence River website has a similar aim. By annotating and downloading relevant segments of media, users can add text, audio and video comments linked to specific segments of the original text on the wiki site. For this application, we are using archival historical documents of the area to provide the focus for the stories. The software tools developed for this website can be reused by a wiki site on another theme, and will provide the multimedia annotation and commenting tools required for this web service (Kutay and Ho 2010).

Searching for knowledge

Another mode of learning is through web searches. Much learning is now done this way via the internet. The internet is a mass of information that is hard for many people, particularly novice users, to evaluate and link into a coherent knowledge system. Toolboxes or interfaces that improve the coherency and comprehension of the results of such searches will help provide this context.

Existing search engines are highly text based, so we propose a project to develop a visual search interface for community knowledge sharing. Such IT projects using cultural information and providing relevance to Indigenous knowledge are designed to create an incentive for Indigenous entry into IT programs.

For the first implementation we are proposing, the visual means of searching is provided within the limited domain of government reports and policy relating to Aboriginal affairs. This will result in a limited semantic domain in which we create tags and tag relationships that can assist searches and allow collation of search data. The Touchgraph website is a good example of this type of search facility.[7]

We also propose to design a visual interface to the search result. One approach is to use Google Instant Preview, which provides a button to view an image of the relevant page (GIP n.d.). However, this link information on the search result screen is not highly useful to many users. What is needed is a format that allows users to navigate through the search while maintaining a view of the entire search scope. The use of interactive graphical software is increasing on websites. This can be used to assist users follow links between related information obtained from web searches.

We also want users to be able to further tag and annotate data to improve the linkage information on the visual displays. This will be in two forms. Users, particularly government and enterprise employees, can annotate a report, funding guideline or policy with information about the individual sections of the document, the location of the communities it applies to, and data on individual communities or regions.

The website is to be developed in line with the Government 2.0 proposal (Government 2.0 Taskforce 2009). Users will also be able to annotate reports and documents on the search site. This material will be retained in a repository as linking

to the site. The sort of information users will tag might include audio recordings of how the report related to their community, or how they ran a program under particular funding guidelines. It will build a repository of relevance of the text data to community process and experience.

At present, many government reports are not available on the internet, or are hard to search. We believe that if communities and individuals develop an interest in accessing and using this data for more reasons than just applying for grants, government departments will be more interested in providing their reports and information online, and so will make a greater repository available for search and annotate functions. Unfortunately, the development of such systems is prone to stalling, as likely users will not be interested until many reports are available and annotated into thematic areas.

Engagement

One factor that we have had to face in our journey in designing and developing IT solutions for communities, organisations and users is that there are very few Indigenous people involved in developing computer resources. Although many of the issues confronting developers of appropriate Indigenous resources relate to novice users in general, there are specific foci and interests that are relevant only to these communities.

Many resources are available for viewing and sharing information online. Users or organisations can use mashups, like Middlespot,[8] to draw together the most useful ones into a single website. However, this requires a depth of understanding and experience of the internet that only comes from previous engagement. If what is on the web is mainly irrelevant, then people do not engage with it.

This is an issue of which comes first. Until people are engaged, they do not know what to ask of web developers. Websites remain static, semi-interactive and developed for one use only, and multimedia materials remain locked in isolated systems, often off the web.

Sharing knowledge is a traditional occupation, but it is a process that has been co-opted by the mainstream institutions and made so remote from Indigenous communities that it will be a slow process to rebuild trust, especially in such an open system as the web.

However, resources such as email lists, calendars, secure document sharing sites and, particularly, repositories are changing Indigenous uses of the web in that people are now seeing the web more as a place to contribute, and not just to read. Also, people are starting to find that information from the one source can come in many forms, like emails from a mailing list or download of blog updates. How do we involve more people in this development? In particular, how do we build resources for the experiential learning that is required to train expert developers?

Training for engagement

There is a need to provide relevant training that enables users to develop their own resources, starting at a basic level and building on that. The sort of training that supports this is based on using the technology in teaching. Flexible learning and the use of these resources throughout Indigenous TAFE and university courses are significant steps forward.

However, we need to extend these services to make more use of mobile access, such as through podcasts, and to engage Indigenous people wherever we can. Mobiles and the portable laptops being distributed by the One Laptop Per Child program in Australia provide an opportunity for children to collect and share audio and video recordings of their elders and their country. By collecting these resources in secure repositories, the One Laptop Per Child program hopes to provide examples for users to share and learn more about the capabilities of computers.

One example of this is the work being done to provide Aboriginal language resources on the web. This has drawn a great response from users, who can now see a relevance to sharing knowledge in their aim to learn their own language. This can be simply a database to search language words, or tools to parse sentences and generate speech from text. These latter tools are not yet highly sophisticated, but their development with an Indigenous focus should be encouraged, as they provide a valuable resource to the language reclamation process.

Conclusion

The growing IT industry is not always considered relevant in Indigenous development issues, yet we have seen from our work with community organisations that almost all areas of research in IT relate to community concerns, either through the provision and sharing of information or through training.

These resources can be utilised by existing community organisations if funding is allocated for the tailoring of web services to Indigenous needs. At the same time, by introducing Indigenous protocols into computing design, we are sure to find interesting applications for these novel concepts in other situations.

It is important that Indigenous people are encouraged and trained in this area of employment to ensure that they are part of this information revolution, as well as to ensure that respect of Indigenous contributions to knowledge management and to our knowledge system is retained into the future.

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Chapter 5

Culture online

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Abstract: *Many Indigenous projects, such as language recording, use existing information technology (IT) resources for cultural sharing on the internet or storing culture on computer systems separate from the web to ensure privacy. However, existing resources are not always suitable for the needs of Indigenous users, and many very creative IT language projects are designed for material in a single language.*

This chapter documents the design of web resources used in the reclamation of the Dharug language of Sydney.[1] *We discuss a Web 2.0 framework for the creation of highly interactive websites that allow users to share these teaching techniques or materials between language groups. Such a framework should deal with the issues involved in teaching and learning Aboriginal languages, including the scarcity of speakers for many languages, the need for audio and video materials online, and the complexity of these languages, which requires novel teaching techniques.*

We also look at international projects that use technology to support community knowledge sharing spaces. These include engineered interfaces that enable users to physically 'interact' with images and computer-generated objects or to use mobile phones to project images and place audio information into the real world, thereby recreating past or future environments. Further, we look at web services that are being used to recreate the community of survivors of recent earthquakes and develop a learning space. Finally, the limited possibilities of existing work on text to speech and speech to text are presented. We relate this work to Australian Indigenous cultural projects and discuss how links might be made, especially with open source software.

Introduction

Indigenous cultural data on the internet is sparse, and much of the existing language knowledge is not easy to distribute publicly. This issue is often a product of the intellectual property and Indigenous protocol concerns involved when non-Indigenous linguists have collected the resources. Also, the language analysis tools available to linguists, such as Audiamus (Thieberger 2006) and ELAN (Crasborn and Sloetjes 2008), are not easy for untrained members of the community to use.

We present online resources that enable Indigenous people themselves to nominate the interface and context of where the knowledge is shared. If this context for the resources can be guaranteed — that is, if access is secure — then the viewing rights to resources can be established directly by the knowledge holder. It is important that the process is not reliant on researchers, as the ways knowledge holders understand the suitable use of information is constantly changing. An example of this is the language site developed by Richard Green, a Darug storyteller from Sydney.[2]

We also look at international projects that use technology to support community knowledge sharing spaces. These include engineered interfaces that enable users to physically 'interact' with images and computer-generated objects, or use mobile phones to project images and place audio information into the real world, thereby recreating past or future environments. Websites are being developed to enable users to recreate communities that existed prior to disasters; for example, by survivors of recent earthquakes (and to develop a learning space for others to engage with communities as they existed). In the final section we present the limited possibilities of existing work on text to speech, and text parsing. We relate this work to Australian Indigenous language projects and discuss how links might be made, especially with open source developments and research projects.

The language of storytelling

This chapter is the result of a journey of the two authors, which intersected many times before their work came together to develop the website to support students and community members learning the Dharug language of the Darug people of Sydney. Richard Green has been searching over many years for information and resources on his language and the history of his people, and has worked with linguists such as Jaky Troy (1994) and Michael Walsh at the University of Sydney to gain a high level of proficiency in a language that was considered dormant, if not dead. Cat Kutay has worked as a technical designer and developer on many engineering and IT projects, and trained users of this technology in Indigenous communities around Australia and the Pacific. She is now working in e-learning, as computing resources are highly flexible and can be redesigned to be appropriate for use by many cultures and

many applications. Green and other language tutors approached Kutay to develop IT resources to share teaching resources, stories and their experiences in language.

IT resources are written in a variety of logical languages based on English, but in order to make training resources more user-friendly we need to adapt them to the language of the user, either Aboriginal English, simplified English, or Indigenous languages. For any online training, a major barrier is language, not only for understanding the training but also for accessing the information on the internet. Computer databases provide a resource to support the many different languages in Australia through storage, analysis and sharing. As a first stage, providing language learning resources in IT seemed an ideal way to involve Aboriginal people in this media, and it is hoped these users will provide the impetus for more web resources that assist in sharing cultural knowledge.

The aim of the Dharug project was to develop a web resource that uses existing open source software to support Green as a language teacher. Most importantly, it had to provide an interactive site for listening to stories, and for Green to upload and link these stories to relevant textual and video learning material.

The Dharug Dalang website was designed as a vehicle for the language story to develop. We used audio and video material provided by Green and others speaking language. We linked these to text that explains the language and gave examples of its use, and we included on the site previous work on the Sydney language by linguists and early colonialists. This included archival material including images of early text-based records of language from the National Library of Australia's Trove website and the State Library of New South Wales. Green also added, in a wiki format, historical information from various sources on the non-Aboriginal settlement of the Sydney area, and the experiences of his ancestors.

The design was to accentuate the flow of language through the site. As a user accesses the front page of the site, they can hear the sounds of individual words and then follow links to further information on different topics of language including plants, animals and country. The site is able to provide this expansion of themes from words and examples to songs because Richard Green is a *Yellamundie*, a storyteller of his people.

The web server translates each page, when accessed, to include links to any uploaded sound files for the word, examples or related song. This allows the site to respond to the user's needs. The system can be used in any language if the database of words is provided; for example, as an export from Miromaa language maintenance software.[3]

Aboriginal languages are languages of storytelling, though not the modern idea of storytelling, where multiple viewpoints are expressed that may conflict or contradict and where people argue to have their particular version of the story told. Aboriginal languages are languages designed for storytelling as a group, where the storyteller knows where their story fits into the whole and can pass on the story to those who know

the surrounding context. We found from our experience in schools that teaching the Dharug language is not about teaching the grammar and the structure of the language; it is about learning to express your story in the language. From this experience, the structure comes. For example, storytelling is highly poetic. It requires language to be flexible to enable sounds and visions to be presented in a cohesive, coherent and, particularly, a memorable manner, so the hearer can remember and repeat the story.

At the same time, it is acknowledged that all languages have structure and, to reclaim the language, the actual grammar has to be understood while not overly stressed. Green's great ability with languages, the ability to absorb these rules and represent them as a coherent language spoken in story and sung in song, has enabled the reclamation of language in Sydney to advance as far as it has. This focus on storytelling has brought the language to life, and made the site popular among his people and school users.

Teaching language

The Dharug Dalang website was funded by the National Parks and Wildlife Service, and the project was auspiced by the Aboriginal Housing Company in Redfern. It is designed to support the teaching style developed by Green, an approach to language that starts with the country. For example, Green's students live in western Sydney surrounded by Dharug words used as placenames and in slang. This is the vocabulary he starts with in his teaching. Green works in the school system, as well as undertaking some teaching in the community. Hence, his lessons are based around what is done in school, the days of the week, greetings and so on. But he also takes the language out of the classroom to talk about the environment, as his main aim in using and reclaiming the language is to talk about the country and its maintenance.

The website was developed as an open source content management system. This enabled Green to edit textual resources about his language and link these to audio resources that he uploaded using the embedded repository system.

Using the content management interface, we added various resources. We started with a word list database with a simple interface in table format with automated links to sound files, which are saved using the same name as the language word. Green uploaded these files to the repository as he recorded them. Gradually, more and more text items were added as articles on the content management site. These text items were sorted into topics, so that a learner could look at an array of items (under plants, for example) that would deal with individual words, example sentences and the history of plant use in the region.

However, we wanted an emphasis on the sound and how the words are used in language. While the text approach can teach grammar, there is in fact much more to the language than simple grammatical sentences. To support the linking of text and sound, if a sound file exists the main interface provides a mouse-activated link that

plays the sound file of that word. The website was therefore designed around the needs of both the novice user developing the site, and learners who will want to focus on the flow between text and sound that is vital in language learning.

As the site developed, we also realised that history of the people was needed as an integral part of the site. That is, the language, in particular its present near-dormant state, is a result of this history. Also, much of the language that Green was using was about the country and the people as they are now, which is of course very different to the way they were when the language was last used. To discuss this history, we added a wiki site embedded within the content management system.

Finally, we wanted to encourage more users to add material to the site. As learners in the community develop, they can add their contributions and put questions to Green. We embedded a blog system in the site to enable this process, while restricting the addition of language learning material to specially registered users.

All these resources are available for any language group to use. The next site being developed is with Les Bursill for the Dharawal and Dhurga languages of southern Sydney.[4] When these websites are first registered and installed, there is no content. However, the teaching structure used in one site can be repeated in another, moving from words to sentences to context. In addition, editing the language word and example sentences and uploading sound bites to link to the word will reuse the word database and the pictures already attached. Through this process, it is easy to develop a well-populated site with many interlinked examples.

Perhaps the greatest advantage for language teaching in using Web 2.0 sites, where many users can register to edit and upload material, is the sharing of the work. It is always very tedious for linguists and the speakers assisting them to collect and annotate sound files for the language they are studying (Thieberger 2004). In this way, we hope to encourage language speakers to collect their own material, which will be automatically labelled with the word spelling they use to name their file and then can be linked to any occurrence of that word on the site. This linkage can be made automatic. However, this relies on standardised spelling of words. A non-ideal solution is that the pages written by one speaker will link to his or her spelling of that word, and hence to his or her voice saying that word.

Language context

Aboriginal languages are considered to be highly inflected and complex, hence the teaching of these languages is viewed as requiring understanding of this complexity. However, for the speakers of this language, proficiency comes through the use of the language in context and this has become an important part of teaching these languages. We discuss here the context of the language and how to understand and teach this complexity.

First, the languages are used in storytelling, and this is often conveyed in song or poetry. This requires a language that is highly flexible to enable the retention of

rhythm and sound through different expressions of country and care of country, human relations and so on (Magowan 2001). By practising the language in different contexts, students can become familiar with different options for formatting sentences and structures, rather than learning rules. For instance, they absorb the way syntactic coherence is not created by word order but by inflection of verbs.

Many of the language inflections and irregularities relate to pronunciation. Some sounds are not easy to enunciate when placed together and, as a language ages, elisions increase (Reyes-Rodriguez 2006). When words are used in verse, elision also increases. It is possible much of the inflection results from this poetic use of language, and so should be learned in this context.

Second, the language is for the encoding of the stories of country and it must describe the country in all its detail. As Bradley (2010) says of the Yanyuwa people, the deep introspection and knowledge required to learn and sing the language reflects the effort involved in learning and understanding the complexity of country. The complexity of language may ensure that similar complexity of thought is required when speaking the language. Perhaps an obvious example is how geocentric languages have developed in areas without directional landmarks, such as the sea, so that speakers necessarily use geographical location when giving direction (Deutscher 2010).

Language reclamation in context

We consider an important issue in promoting language reclamation to be an understanding of how the many Australian languages co-existed pre-settlement, and hence the need to reclaim each one within its area. These languages often vary in structure, yet did not develop to dominate each other, nor develop pidgin forms. Presumably these different languages were seen to have different uses or applications. This is important in light of the competition for funding and access to school programs. With the dominance of English, many previously robust Aboriginal languages are succumbing to Kriol (O'Shannessy 2005), a development of concern to linguists and older speakers alike, as the stories in these languages will be lost.

Many dialects of Dharug were used in the Sydney area, and many other languages (none of which was dominant) were shared, both with traders and as people moved through marriage and ceremony among the region's different groups. As the stories of land use and environmental care were told in the local language, visitors to each area would have to learn the local language to understand these stories.

When the level of difference between two languages was great, it was necessary for speakers to explain the meaning of expressions in full detail, retaining a complexity of expression in each language used around the Sydney region. Comparison can be made with smaller European languages that retain much of their complexity of expression. The complexity may be to provide semantic clarity and assist comprehension for novice listeners. European researchers within the Variflex research program, which

looks at variation in inflection, consider how language learning is both affected by and affects inflection (Blom and Geert 2004).

Through the Sydney experience of teaching languages both on and off country, we have found the ability to relate the language to the location of the learner is a much more important factor for long-term learning than the immediate availability of tutors and teaching resources. Green found two supporters for language teaching in Sydney, through a western Sydney school and through the National Parks and Wildlife Service, an organisation concerned with land and environmental preservation, which is greatly enhanced by retrieving the history of land care and environmental change in the area. We are also gathering stories about caring for country for the language site, although many of these will now be told only in English, and hence will have lost much of their descriptive and explanatory detail.

Relating to virtual worlds

We have also researched how we can use virtual worlds in our teaching. There are two ways these can assist in knowledge sharing. Much material that is called knowledge is simply information that will make no sense unless connected to more information, or located in a suitable context. This context can be a virtual world inside the computer, or a virtual world projected onto the real world.

There are interfaces available that enable users to physically 'interact' with images and computer-generated objects. People can use an image of an environment and locate information on this model. This may be a Google map or a virtual world such as Digital Songlines.[5]

Mobile phones can also project images and place audio information into the real world, recreating past or future environments. This technology has been employed in a history project at Parramatta (DigiMacq n.d.). We are seeking funding for the development of a storytelling audio and imaging system for mobile phones to be based on the Aboriginal history of Parramatta.

Using existing software frameworks developed to enable organisations to create their own location-based mobile games such as Viking Ghost Hunt (Naliuka et al. 2010), it is possible to insert the voice and images at specified locations for users to encounter as they walk to that location. Such interfaces allow gaming structures, such as when the user answers questions or makes a selection to choose a path through the story.

Online repository of oral history

The next stage of this work is to link more detailed language stories to word examples, and to the location of such stories using Google Maps, for instance. This work relates to shared knowledge repositories where different users can upload material to form a

community narrative (Cronin 2010). By linking knowledge in this manner, we aim to emulate some of the features of the traditional method of storytelling about country (Kutay and Ho 2009), such as the role of different knowledge holders in retelling a story and the different perspectives that are incorporated within group stories.

It is interesting that many people, particularly in Europe, are developing similar web-based services to collect oral histories about special sites. There are various requirements for such websites, and we discuss some here and how they may be applicable to Aboriginal users in Australia.

Live memories at Trento University

This Italian research project (Magnini 2009) provides web resources for communities to collect and link images, text and recordings about places in the past and how they used to be. For instance, after the earthquake in L'Aquila, people in the region wished to develop a site where they could share memories of what their community was like before it was flattened.

Researchers on this project have found that the main obstacle is gaining stories to place on the site, and in this work we consider some of the issues that may arise when seeking contributions to such sites in Australia. It is interesting that the title of this project is reminiscent of the Living Memories tour of New South Wales, which was developed by the State Records Authority of New South Wales to present records of the Aborigines Welfare Board.

Virtual Campfire in Afghanistan

There is a similar need in Afghanistan, where many communities have been wiped out by war and many historical monuments and buildings lost forever, except in people's memories. Initially this project, developed by the Information Systems department at RWTH Aachen University in Germany, was to assist archaeologists planning to work in the region (Klamma 2009). Before going to the site, they could be trained using material collected from people in the area.

The material can be uploaded from mobile phones or edited online. This allows community members to not only view the resources, but also add to them in what is called a 'social software' system. The approach creates what is known as content 'prosumers', consumers and producers in parallel, anywhere and anytime. The aim is to provide more flexibility in content and context to other social data-sharing systems such as Facebook.

The example service called Virtual Campfire (Cao et al. 2010) is a mashup of many services that provide a system of highly interlinked video, audio and text files. A mashup is an important feature of open source development. This is where different, independently developed programs provide different functionality. To create a fully functioning software resource or website, the programmer collects the relevant software and edits each part to fit within the whole, providing a single login to access

all functions, or tools to link items in one interface (like Google Earth) to items in another, such as videos about tagged locations.

In Virtual Campfire these services provide a framework to create, search and share multimedia artefacts across communities using context awareness. The aim of this project is to support the linking of knowledge 'in the cloud' (Knorr and Gruman 2008), where knowledge from many sources, and in many media formats, resides on the internet and can harness web links to interconnect a growing pool of knowledge.

Each user can create a new project on the web service provided by Virtual Campfire. A project establishes the theme for a particular knowledge repository, but the various services are available to all projects, so the enhancements developed for one context can be used in another project.

An example of the use of a similar system developed by the same team for mobile sharing of multimedia is a personalised learning environment tool (Cao et al. 2009). This system allows users to share translations and multimedia resources relating to classical Chinese poetry, and offers tools to link users' translations with text, audio, video and images in an interface that they can view on a mobile phone or the internet. This research shares many of the aims of the work presented in this chapter; namely, providing access for many users so as to improve Dharug translation resources, as well as a variety of content and media formats for the materials available in this learning system.

Application in Australia

We are looking at a similar mashup system for use in Australia. The aim is to reuse existing web services where possible and provide an interface that is user-friendly for novice computer users and accessible for upload by mobile phones. In existing community narrative sites (such as the Clarence River History site[6]) users may elect to create visual links for their stories to other material on the website such as maps.

From previous research into Aboriginal use of the internet (Dyson and Underwood 2006; Kutay 2010), the main issues influencing participation, and hence the number of stories uploaded, are:

- trust — knowledge can be misinterpreted if used out of context, so issues of security, such as the download and sharing of artefacts, are of concern for users
- access — mobile access as mentioned above is vital for many users who lack computer or internet access on a regular basis
- language — the language used on sites to assist users must be simple English, or audio links
- interface — as well as language, the way users can navigate the site, and the relevance to people's lives of the story themes on the site, will greatly encourage, or discourage, contributions

- relevance — the interface, content matter and approach to material, such as preference for audio over text, tend to make a website more or less relevant and accessible to Indigenous people.

In addition to these points, we found integration or context to be an important issue. To start a story, we need to focus on materials that inspire people to respond. This can provide a context for the materials, which also assists with the issue of trust mentioned above.

Text to speech and speech to text

There are areas of software research that may be useful to the future development of learning sites for Australian Aboriginal languages. These are for the generation of sound examples and the automatic translation of users' examples of language.

The collection of sound files for language words is very slow, even given the open user access provided by the language sites presented in this chapter. This process either involves the annotation of archival tapes, specifying the start and end time of each word that can then be used to link to that word (as used on the Dharawal website) or the recording and uploading of each word separately as used on the Dharug and Wiradjuri (Kutay 2008) websites.

A similar approach was taken on the William Dawes website,[7] where the designers aimed to include modern-day pronunciation of words alongside the old spelling system devised by Lieutenant William Dawes. However, little material has been made available so far.

Another approach to providing language support is through text to speech synthesis and language translation parsers. Progress in speech to text has been slow. In English this has been mainly due to the irregular phonetics of the language. Work done to support Aboriginal languages using these computer resources was carried out on the Wiradjuri language of central New South Wales, which is being taught in three schools in Sydney.

Wiradjuri speech synthesis

Working with students at the University of New South Wales, we developed a speech synthesis system for Wiradjuri (Wu 2007) using a method called concatenative synthesis. In this method, we put together diphones or pieces of pre-recorded sounds of all the pronunciations of a language and then applied signal processing to synthesise the speech. We used a free concatenative speech synthesis system (the Festival Speech Synthesis System; see CSTR n.d.).

Since Wiradjuri has been written as a phonetic language, where the pronunciation of a word almost completely matches the spelling of the word, it was easy to derive the diphones required to construct each word by concatenation. Therefore, a rule-based

approach is sufficient for covering the vast majorities of the words; if there are exceptions, these words can be explicitly defined inside the lexicon file. Similarly, for intonation pitch we assumed a simple stress on the last syllable for one- and two-syllable words, and on the second-last syllable in all other words except for repetitions such as *birra-birra* (very tired).

The resulting speech formation was fairly mechanical and not considered a suitable tool for school learners. While preferring to use modern speakers, we are still interested in using such an approach as an additional aid for adult learners to verify the sound of the language from written archival material.

Wiradjuri parser

Another project developed with students at the University of New South Wales was a Wiradjuri parser (McLeod 2007) based on Steven Bird's Natural Language Toolkit written in python (Bird et al. 2007). As the name suggests, this program provides a toolkit that is editable for each language. The rules of the language can be coded in to the system, including exceptions, to provide guidance for the word/segment differentiation and phrase translation by the parser.

The Wiradjuri Toolkit design is shown in Figure 1. This system deals only with simple grammar, and provides a literal translation rather than an English expression.

The parser has limited use in schools, as the output is not in correct English format. However, it does provide a very simple translation tool that tutors can use to check their own understanding of the language. As we are dealing with tutors who are often learning the language themselves as part of reclamation work, this type of support is quite helpful.

The language parser has been linked to a Wiradjuri database, which includes sound files for each word, and amalgamated into a tutors' support tool. This tool assists tutors to develop example sentences and worksheets for students in Wiradjuri but can be used in any language if the database is changed (Kutay et al. 2010).

Conclusion

This paper has described the process of development of language learning resources for Australian Indigenous languages. The open source community has provided most of the software used in the projects discussed. When the code has been adapted for the specific applications, this has been made available online for other users, where possible. Also, as the code designed for Indigenous users is developed, it can be made available for further enhancement by the open source community if licence conditions are maintained. It is important that the Australian Indigenous community be given access to these free resources in a format that is useful, and with an understanding that it is the code, and not the data, that is open to editing.

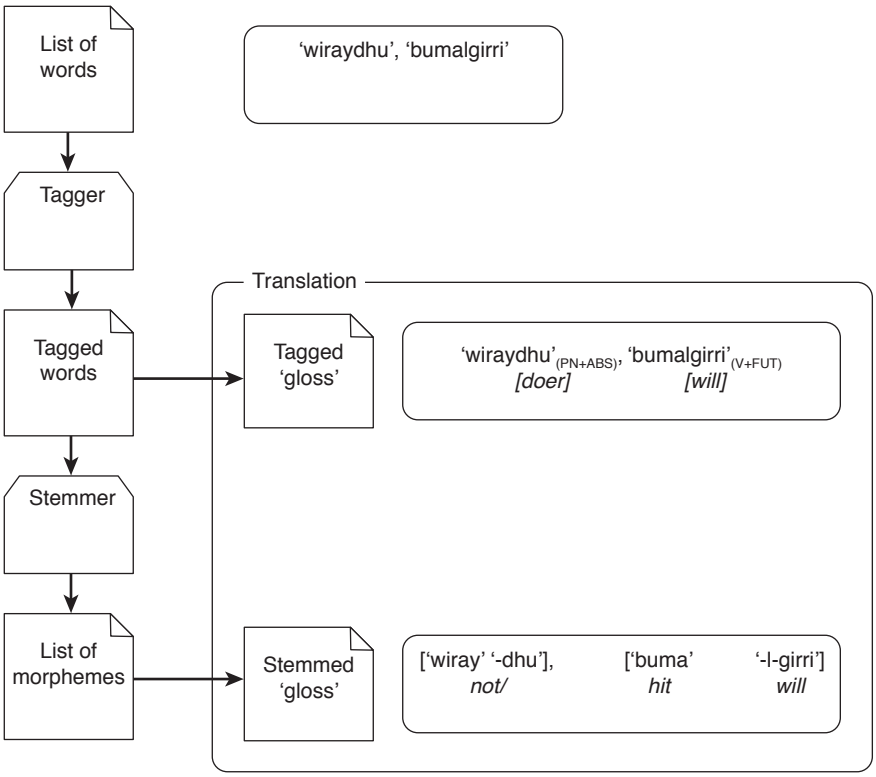

Figure 1: Wiradjuri Toolkit components

In the first instance, however, it is important to clarify the software needs of the users. While code exists for many applications, it may not quite fulfil the expressed needs and computer skills of the users and hence require redesign or redevelopment. Therefore, some funding is still needed to develop the mashups linking different functions that exist in web services or to provide extra enhancements to existing systems.

We believe that IT in its many forms provides an important avenue for language reclamation and cultural exchange for Indigenous people in Australia, and that government departments at all levels should be proactive in supporting the development of relevant software e-learning systems rather than individual language resources written in software. Also, IT provides the opportunity for highly creative use of audio-visual material to make interesting learning environments. In particular the emphasis should be on designs that are flexible and have multiple, rather than single, applications.

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Notes

1. Throughout this chapter 'Dharug' has been used to refer to the language and 'Darug' to refer to the people.
2. University of New South Wales and Richard Green, 'Dharug dalang: A collaborative tool for language teaching', <www.dharug.dalang.com.au> accessed 23 May 2013.
3. See Miromaa Aboriginal Language and Technology Centre, <http://www.miromaa.org.au/Miromaa/Download-a-Brochure.html> accessed 23 May 2013.

4. Above n 1 accessed 23 May 2013.
5. The Digital Songlines game engine was developed as part of a digital storytelling project undertaken by the Indigenous Communities Program at the Australasian CRC for Interaction Design (ACID). The engine was developed in collaboration with Cyberdreaming Pty Ltd (see <http://brettleavy.wix.com/digital-songlines#!> accessed 16 May 2013).
6. Clarence River History website, <www.clarenceriver.teachingforchange.edu.au> accessed 23 May 2013.
7. Available at <www.williamdawes.org>.

Chapter 6

‘We have a Dreaming’: How to translate totemic existential territories through digital tools

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Abstract: *At the closing plenary session of the 2010 Information Technologies and Indigenous Communities (ITIC) Symposium in Canberra, delegates decided to write a series of recommendations for improving Indigenous community access to digital technologies.*[1] *A young Martu filmmaker, Curtis Taylor, from Parnngurr (Cotton Creek), came to the microphone and said, ‘We have a Dreaming like our elders: in the mind; digital technologies.’*[2] *This chapter shows some analogies between the cognitive mapping of desert Dreamings, the rhizomatic structure of the web, and the cultural and political contexts of the use of digital technologies. These are discussed using examples of films made and disseminated by Indigenous Australians so as to stress their messages on YouTube and similar sites created since the mid-2000s. Also discussed are technical and anthropological issues relating to the project of expanding into a pilot website a CD-ROM I developed in the 1990s with 50 Warlpiri artists from Lajamanu. The issue at stake is to analyse, amid the indifference and hostility of the public space as expressed by politicians, media and some scholarly discourses, the ways in which marginalised human groups, such as Indigenous peoples in many parts of the world, enounce and construct their subjective singularity and existential territories in the process of social transformation and displacement. In this sense, the web today is a platform to enhancing local expressions of agency and the politics of projected cultural claims as new systems of knowledge and collective intelligence for the future. Such a development challenges the responsibilities of anthropologists.*

Aboriginal reticularity and the agency of transformative networks

In a volume on Actor Network Theory, Bruno Latour (1999:15) writes, 'Now that the World Wide Web exists, everyone believes they understand what a network is', but before the web came into being:

> the word network, like Deleuze and Guattari's term rhizome, clearly meant a series of *transformations* — translations, transductions — which could not be captured by any of the traditional terms of social theory. With the new popularisation of the word 'network', it now means transport *without* deformation, an instantaneous, unmediated access to every piece of information. That is exactly the opposite of what we meant.

Another word he criticises in Actor Network Theory is 'actor', for it too is often confused in debates about agency. In computer language, but also for some social scientists,[3] the notion of agency, agent or 'actor' only refers to 'action', says Latour, and does not necessarily imply an actual empowerment in the sense that was put forward by the work of Deleuze and Guattari, or Foucault, which was all inspired by Spinoza's philosophical notion of *puissance d'agir* (the power of acting) in the sense of being able to transform things and perceptions. I postulate that the way Aboriginal people, and many Indigenous peoples across the world, use the web today is an attempt to transform the perception we have constructed of them through social sciences and other discourses that precisely deny them agency by not taking into account their voice, social practices and desires. My work as an anthropologist over 30 years has been motivated by the search for ways to translate and enhance Aboriginal agency as a dynamic, flexible way of reproducing their social organisation, cosmological perception and ritual practice, but also in their struggles for social justice. With all the historical changes and pressures that the Warlpiri and their neighbours have experienced, especially over the past decade, the web has become a new platform to express this political agency, with cinema being another.[4]

When I went into the field in Central Australia in 1979 and 1980, I was struck to find a dynamic transformative reticularity (network structure) in the Warlpiri conception of space and time: 'The Dreaming appeared to me not like a mythical time of reference but as a parallel space-time, a permanency in movement, with which the Warlpiri have a relation of feedback' (Glowczewski 1988; Rose 2000:41).[5] Indeed, I was lucky to record then, and over later years in Lajamanu, many rituals and a creative use of dream revelations for new ritual songs, dances and body paintings relating to stories that connect places through totemic mythical hybrid ancestors and spirits of children to be born. The result of these geographical connections — which are flexible according to narratives, songs and contexts of new alliances, mourning or dream

revelations — is an open network of hundreds of virtual pathways or totemic trails. My rhizomatic description of Warlpiri individual and collective subjectivity projected onto a cartographed environment fascinated Félix Guattari in 1983 (Glowczewski 2011). Our discussions over the years contributed a little to the elaboration of his *Schizoanalytic Cartographies*, a matrix combining four poles traversed by arrows of time: the 'virtually real' (Existential Territories), the 'actually real' (Economy of Flows: libido, signifier, capital, labour), the 'virtually possible' (Incorporeal Universes) and the 'actually possible' (Machinic Phylums). The Aboriginal cartography of desire was one example he gives of an active production of 'existential territories', which connect people with memory and senses in a dynamic process of emplacement both actual and virtual (Guattari 1995).

I proposed in the late 1980s to translate the cosmological relation between the Warlpiri concepts of *kankarlu* (above, on the surface, outside, public, manifest) and *kanunju* (underneath, under the surface, inside, secret, latent) as actual versus virtual; not just as a dual opposition, but as a topological device playing with continuities and discontinuities where the 'above' realm reflects the process of 'actualisation' while the 'underneath' realm reflects the process of virtualisation (Glowczewski 1988, 1989; Laughren 1993). This process is understood here in the way that Deleuze and Guattari (1987) defined their concepts of actual, virtual and *devenirs* (becomings): that is, a constant transformative process that questions the dual opposition between reality and the imaginary. I defined totemism as a process of multiple *devenirs*, and the Aboriginal struggle for the recognition of these cosmological links with the land as a form of resistance to capitalistic flows. Guattari's own writings — especially his concept of ecosophy, which articulates, together, the ecologies of the mind, of the environment and of technology as a political and ethico-aesthetic paradigm — are currently rediscovered, translated and discussed in several disciplines, even though he died in 1992 before the emergence of the web and its social networks. For instance, the philosopher Brian Holmes (n.d.) writes:

> Guattari took the perspective of an artist and an activist, seeking an ethico-aesthetic paradigm. He explored all the technologies of his day and laid the theoretical and practical basis for the wildest media experiments of the 1990s, even while carrying out a fundamental critique of information science and its applications in the capitalist societies. His aim was to appropriate the powers previously ascribed to myth, in order to reconfigure the articulation of bodies and machines (the relations of biosphere and noosphere). This was the desire of the *Schizoanalytic Cartographies*: to provoke fresh intersections of artistic constellations, existential territories, social flows and abstract ideas. Not a map of positions and probabilities, but a set of vectors whereby the virtual and the actual come to meet. A cartography of escape routes leading beyond the black holes of neoliberal control, toward the possibility of collective speech.

When multimedia technologies became popular in the mid-1990s, I thought it ideal and challenging to design an experimental cognitive mapping, a hypermedia connecting machine, to try to 'translate' with hyperlinks the traditionally reticular model of the desert people who connect sacred sites with mythical stories that are ritually sung, danced and painted. The analogy with hyperlinks was twofold. Aboriginal people have different media, including stories, songs, dances, body paintings, sand stories, canvas paintings and kinship rules, which are related. I had recorded such Warlpiri media in Lajamanu since 1979 with my own media: audio tapes, photographs, films and notebooks, whose contents and my interpretations needed to be reconnected with each other to return the proper ritual meanings. But I was also seeking to enhance the understanding of the principle of these connections through the use of the digital system itself. I wanted to show that the Warlpiri principle of connections was visually resonating with this new technology in its own reticularity: a network of hundreds of named places that could be linked through thousands of different songs that produced songlines or pathways for different Dreaming heroes. The important point was that, instead of being a classificatory closed system, these 'story lines' — not actual paths, but virtual tracks expressed though myth, songs, drawings and dancing — were intertwined with each other in a way that was partially open, according to specific cultural protocols, to new interpretations and connections that were often revealed through dreams.

Cultural protocols for making an Aboriginal hypermedia

I designed a menu, which was an interactive map of 14 superimposed constellations of different Dreaming (Tjukurrpa) pathways that connected a selection of some 80 named places chosen in Warlpiri land. The selected places out of some 1000 Warlpiri-named sacred sites, which included rock holes, springs, hills and so on, were the ones most often painted by the Warlpiri women and men in Lajamanu when they started to use acrylics to paint their Dreaming stories and related places on canvas in 1986. This was an adaptation of the Dreaming totemic designs they were painting with ochres on the body and sacred objects, or drawing on the sand. The data that I had collected earlier during rituals in 1979 and 1984, before the start of the Lajamanu art movement, were related to the Dreamings they were now painting on canvas. So I used a sample of their knowledge, organised into 14 constellations of Dreamings, that they had chosen to make public by using them in paintings to be circulated all over the world. Thanks to hyperlinks, I was able to connect my old data with paintings of the places and Dreamings they were painting on canvas in the mid-1990s. The digital result was thus inspired by the cognitive mapping of the Warlpiri themselves, whose reticular ways of organising knowledge about places, and Tjukurrpa (Dreaming) stories and songlines, seemed to reflect the network and hyperlink principles of multimedia and the web (Glowczewski 2005a). In 1995 I worked with a very knowledgeable

Warlpiri lady in her late forties, Barbara Gibson Nakamarra, to check the translations of a sample of songs and stories from my 1984 recordings (Glowczewski and Nakamarra 2002).

The original version was designed as an HTML digital program and was tested on the intranet during a Qantum Indigenet workshop at the Lajamanu school in 1997. At the time the community did not use the internet, so the Lajamanu artists and council members were told that they should be careful about how their knowledge went online. Everywhere in the world Indigenous peoples were then starting to think about how to protect their intellectual property. The artists, mostly elders, were very happy that I had respected the taboo on the images of the dead by developing a digital tool to mask images of people who had passed away. The graphic chart followed the colours of the Aboriginal flag: black for the background, all text in yellow, and words in red wherever there was a hyperlink to another section of the digital program. For instance, a lexicon window would appear as a roll over to explain any Warlpiri word, and a change of pathway was proposed for every placename that was common to two different Dreaming tracks. The students and adults involved were invited to choose one of the 14 constellations of Dreaming tracks that they were custodians for as *kirda* (owners) or *kurdungurlu* (managers) through Warlpiri kinship. Each constellation included about an hour of data: films and photos of rituals and places, photos of body and canvas paintings, and related Tjukurrpa (Dreaming) stories, songlines, images or geographical marks called *kuruwarri*.

My challenge was to allow Warlpiri elders in the community, who could not read and write, to check the content of the links, and also for children to navigate through the images and sounds. I designed smaller icons so Dreamings could be recognised without having to read the attached English or Warlpiri titles and texts. For instance, a little vine for the *ngalyipi* (Vine) and *ngarrka* (Initiated Man) Dreaming constellation, or a grinding stone for the *ngurlu* (Acacia Seed) and *wampana* (Wallaby) Dreaming. The checking process of this digital resource in Lajamanu was very well received. All generations were navigating together on the ten Mac computers in the school computer room. The program also featured QuickTime films, including two films made by the Warlpiri filmmaker Francis Kelly Jupurrurla.[6] He was living in Lajamanu when he filmed the women's *yawulyu* (dancing) for an exhibition I had organised in France with art from Lajamanu and Balgo, a community in Western Australia with which Lajamanu holds ritual exchanges (Glowczewski 1991). The navigation available for testing combined information about Dreaming tracks that connect Warlpiri people from Lajamanu and other groups from Balgo.

The Lajamanu elders and council asked that the program be based only on data gathered in Lajamanu and they did not want to make it available on the internet. They were interested in it being made available to outsiders to help to contextualise their art for them, but only on the condition that they would have control over what content would go into the program. I was asked to record new songs with men to add to the

1984 songs that I mostly recorded with women. Back in France, to respect the Warlpiri desire to protect their data from the internet, I decided to reprogram everything using the Macromedia Director proprietary software for making CD-ROMs. This meant that the amount of data used had to be reduced to the 600 megabytes available on a CD-ROM. I managed to compress photos, films and sounds so as to allow for 14 hours of navigable materials, a sample of three hours of sound containing Warlpiri stories and songs, half an hour of films including silent 16-millimetre footage I had shot in 1979 with a post-edited soundtrack, and short videos from the 1990s demonstrating various hand signs. In the following year, 1998, I went back to Lajamanu to check this new format.

To contextualise the Dreaming constellations interactive map, a section called 'the notebook' offered 20 thematic entries including art, contact history, hand sign language, deaths, the church with images, and texts extracted from my French publications and translated into English. The 'fieldwork and anthropology' entry described the CD-ROM-making process with a photo of the Qantum Indigenet 1997 workshop. The 'multimedia' entry presented the Tanami Network, which then connected (via satellite) the Broadcasting for Remote Aboriginal Communities Scheme (BRACS) facilities at Lajamanu to other Warlpiri settlements and the hospital and jail in Darwin. It also showed the photo of Paddy Patrick Jangala filming a long line of women at the Granites in 1984 during the making of the first Lajamanu video. The elders had decided to make a film for the mining company to explain the importance of this sacred site in the Tanami Desert so as to protect it from gold exploration. This site was later fenced off for protection. At the time, unfortunately, people filmed over the original tapes, and there is no archive of this video other than my photographs of the different scenes when the Lajamanu law women performed each of the many Dreaming places, the springs, rock holes and rocks that are significant within this big sacred site of huge granite boulders.

The Warlpiri elders in Lajamanu were delighted that this experimental digital resource and device enabled us to illuminate and put into practice an insight into the reticularity required for navigating through the Aboriginal knowledge encrypted within places and songlines. Children were excited about having a computer 'talking in Warlpiri' with photos of their families. This pilot version of the CD-ROM called *Yapa*, meaning 'People' in Warlpiri, received the special prize from the jury at the international multimedia Moebius competition in France. This allowed me to approach UNESCO to develop a version compatible on PCs, as the first version of the CD-ROM that was installed at the Lajamanu school in 1998 was only for Macs. We developed a special protocol with UNESCO Publishing that allowed for one-quarter of licence sales to museums, universities and individuals to go back to the 50 contributing Lajamanu artists who would hold joint copyright.[7] The 50 artists were represented by the Warnayaka Art Centre, the Lajamanu art co-operative that was then managed by the famous Warlpiri artist Jimmy Robertson Jampijinpa.

He was one of the 12 Warlpiri men who had been in Paris in 1983 to create a big sand painting of *Pirtina* (Python) Dreaming for the sacred site of *Jurntu* at the Museum of Modern Art, and to dance a dreamed *purlapa* (public ceremony) based in this same law in the Peter Brook Theatre.[8] The final agreement to publicly release this CD-ROM with UNESCO was reached in August 2000 at a Lajamanu Council meeting organised with John Stanton, Director of the Berndt Museum, as part of a collaboration established with my institution in France, the National Scientific Research Centre (CNRS).[9]

The Aboriginal appropriation of ITIC and YouTube

Jimmy Robertson Jampijinpa came to Paris in May 2001 to launch the *Dream Trackers* CD-ROM (Glowczewski 2000) at a symposium on Indigenous identity and new technologies organised at UNESCO with CNRS. For four days Indigenous writers, publishers, curators, scholars and artists from all over the world spoke with anthropologists and linguists about the use of new technologies, protocols and partnerships in different Indigenous projects. One of the 64 Indigenous guests was Marcia Langton, who gave a keynote address and also read a presentation by Helena Gulash on the pilot of the Ara Irititja digital archive project. Jimmy Jampijinpa talked about his first contact with white men as a child and sang a song about funeral paybacks.[10] Many Indigenous representatives asked him to demonstrate the use of the *Dream Trackers* CD-ROM and recommendations were made to UNESCO to support the production of similar digital tools with other communities. When interviewed by a reporter for the UNESCO journal (*Source*, June 2001), Jimmy Robertson Jampijinpa said, 'This CD-ROM brings people to the mind.'

A big question in the 1990s was the secrecy surrounding knowledge that justifies its restriction in terms of public access in writing or in multimedia. The issue in Lajamanu was not necessarily about the content of knowledge, but the way and scope in which different kinds of knowledge are linked. It is the power of making connections that gives the power of understanding. Elders become wise and influential through alliances formed all their lives that allow them to build different links through a network of people who carry very different knowledge. Some Lajamanu men of my generation, who were in their forties during the making of the CD-ROM, have experimented with a different life of power influence. They did not go through the same stages of initiation as their elders, or to so many ceremonies or other events, to expand their alliances. Yet they gained other types of knowledge in their discussions with mining companies, government officials, lawyers for land rights claims and so on. They were bitter about the scope of their own traditional knowledge and would say things like, 'Why should this power of connection be given to an outsider [through the CD-ROM], when it takes us so much time of hard work and rituals, travelling the land and all that, to acquire such knowledge' (Glowczewski 2005b). However, older people, who knew

that the CD-ROM was only presenting a very small sample of their knowledge, did not feel threatened. On the contrary, they wanted to demonstrate how their knowledge works, because, as Jimmy Jampijinpa said, 'It brings people to the mind' by showing these principles of connection that help others to understand their relation to the land and the importance of their Dreaming law.

In 1979 I was allowed to film Warlpiri women dancing, on the condition that I screen this footage only to women in my own country, France. This was secret women's business connected with the *Kajirri* initiation of 22 young men. According to Mervyn Meggit (1966), women were excluded from this initiation ceremonial cycle, which he spelled 'Gadgeri' 30 years earlier. During my fieldwork experience in Lajamanu in 1979 and 1984, I witnessed a daily negotiation between 'businesswomen' and 'businessmen', as the Warlpiri call people in charge of rituals. Each day over weeks, each gender would stage a process of exchange between the kin involved in this *Kajirri* ceremony for transforming young men into *Malyarra* initiates. The production of the individual value embodied by each initiate was conditioned by the secret value of the dancing, singing and painting of sacred objects in separate spaces by men and women. Between 1995 and 2000, during the process of returning my films and other data for the *Dream Trackers* CD-ROM, the 50 custodians of Warlpiri law, who were involved in this project through their recorded rituals and recent acrylic paintings on canvas, agreed to include for general viewing some women's-only footage from 1979 on the condition that they were paid for this intellectual property and that it was not put on the internet. This negotiable aspect of value — of what is 'dear' or 'cheap' in the public performance of women's rituals and how the boundaries of what can be shown or not can shift over time — has been highlighted by other anthropologists (Christen 2008; Dussart 2000; Poirier 2005). So one way of expressing the value of the Dreaming knowledge stored on the CD-ROM was to make users recognise the individual copyright of individual artists when seeking to reproduce their works, and to have them pay for licences to access related information.

From 2001 to 2004 a teacher who was looking after the information technology room for several years in the Lajamanu school facilitated access to the *Dream Trackers* CD-ROM for all generations, so that children, young people, literacy workers and older kin were all welcome at the school. In September 2005 I went to Lajamanu to bring copyright payments from a publisher for the reproduction of paintings in a photo book that compared art and rituals from Lajamanu and Galiwin'ku (Glowczewski and De Largy Healy 2005). The CD-ROM was accessible to the community, not only in the school, but also in a special room set up next to the Lajamanu Council office, where three PCs were installed for internet access. A constant flow of people of all ages, including young mothers with babies on their laps, were using these facilities and browsing through various Aboriginal websites. I was then asked why our *Yapa* CD-ROM was only on these hard disks and not on the web. With digital technologies entering the economic and political life of Indigenous people in Australia, either to

promote their art or convey social messages, many Warlpiri users started to think that it was important to use the internet to explain to their young ones the knowledge connections of their Dreaming law and culture. A similar shift was then taking place in other places like Arnhem Land, for instance, with the Galiwin'ku Knowledge Centre, where a digital archive was being developed with materials returned from different collections in museums and elsewhere.[11]

In 2006 a young Warlpiri literacy worker from Lajamanu, Steve Patrick, known by his Aboriginal name Wanta Jampijinpa (2006), elaborated on a complex cognitive system that encompassed the concept of *ngurra-kurlu* (belonging to land), which he promotes as a teaching tool and a strategy 'to work with Warlpiri' language and people in many ways. On YouTube, we hear his voice in Warlpiri and see subtitles and his hand drawing a sand design in which five circles represent Warlpiri cosmo-sociological concepts he translates in English: *ngurra* (land) in the centre, and around this, *kuruwarri* (law), ceremonies including *purlapa* and *jarda-wanpa, jaru* (language) and family structures that comprise four interrelated father–son 'skin' groups. These five concept circles are connected by lines as an expression of interconnections that hold together this Warlpiri system of knowledge. Wanta Jampijinpa explains that, if a link between any two of these concepts is broken, or if any concept does not hold strongly, everything collapses; for example, if language is not taught, if family is dislocated, if ceremonies are not performed, if land is not looked after and so on.

After that, we see him in a schoolroom with papers on the pin boards. He explains the meaning of an acrylic painting, which is standing on a couch, and like his sand drawing also has a five-circle structure. This time around the central circle is for the land; the other four show the complementarity of the four skin groups: *Yarriki* designates the patrifilial group of the speaker's mother; *Wurruru*, the patrifilial group of the speaker's mother's mother (also man's mother-in-law, woman's son-in-law); *Kirda*, the patrifilial group of a spouse (woman's children or wife's father); and *Wapirra-jarra*, the speaker's patrifilial group. A colour is allocated to each of these four skin group circles. Blue is for owners of the Water and Emu Dreamings, like Wanta himself, and is represented by an emu footprint painted in a blue circle. Green is for owners of the Yam Dreaming, with a yam rhizome painted in a green circle. Red is for owners of the Wallaby Dreaming, with a wallaby footprint painted in a red circle, and yellow is for owners of the Bush Turkey Dreaming, with a bush turkey footprint painted in a yellow circle.[12] These painted footprints are not explained on the video, yet are like icons for all the other Dreaming constellations under the care of each of the four Warlpiri skin groups. They visually summarise a Warlpiri conception of the cosmos, and people's place and duty for maintaining the balance within their land and society.

Wanta Patrick Jampijinpa established, with Tracks Theatre Company, the Milpirri 'Raincloud' Festival to promote these concepts through local events at which young people wear these four colours and dance in their skin groups with elders. He also

developed guidelines for Indigenous Protected Areas of land. In May 2009 he was invited to France by the Musée des Confluences in Lyon for a meeting called Paroles Autochtones 'Indigenous Voices', along with another young Indigenous Australian from Queensland who authored a book on his language (Sullivan 2005) and five Indigenous students from a United Nations training program. They spoke with different audiences in the city, where two Aboriginal exhibitions were also organised, and a film was produced with all the Indigenous guests (Galindo 2010). Wanta Patrick Jampijinpa said in one of these meetings, like Jimmy Robertson Jampijinpa nine years earlier, that the purpose of his Milpirri Festival project was 'to bring people to the mind'.

This Warlpiri interpretation of the analogy between social, ritual, and mental or cognitive networks also relates to digital networks as tools to 'bring people to the mind': that is, to understand how meaningful and emotional connections work, and how thinking can act as a propeller for action. Such a vision is a challenge to anthropologists to construct more than simple databases with Aboriginal knowledge. Our work is to do some kind of interpretation, and not only to limit ourselves to classifying raw data into our Western categories. I mean that data speak if they are connected with different kinds of meanings that go with them. Nowadays, on the internet, you can use any search engine, like Google, to interrogate a word, a name or a concept, and you will have thousands of web links that are proposed. Yet this information is not organised, only prioritised by number of visits to each website in descending order. In other words, it is the websites that are mostly visited that are returned as top choices, like Wikipedia, and not the most relevant to finding first-hand data. Organisation of data, through research currently developed by some anthropologists and ITIC specialists in other disciplines, is about trying to develop a semantics of interpretation and create specific ontologies that allow for searched concepts to be returned with links to their various meaningful connections and the stories they carry; with the links these imply for related concepts; and, at the same time, the specific that ethics are at stake in relation to the circulation of knowledge.

Transmission of knowledge and cultural creativity

By 2007 half of the elders involved with the *Dream Trackers* CD-ROM had passed away, so I went to Lajamanu for a big meeting to find out who were the inheritors of those 25 elders. The money for each of the 50 copyright holders was only $200 — 'lollies', as some Warlpiri say. I proposed to put all the money in a collective fund to restart the Warnayaka Art Centre, which was in a process of re-registration as a business after requests from many artists and the Lajamanu Council. The program was already in its seventh year and there were not as many sales of licences as during the first years, when thousands of dollars from CD-ROM sales were transferred from UNESCO Publishing to Warnayaka Arts. The centre was closed in 2002 after the death of its chairman, Jimmy Robertson Jampijinpa. Following

various attempts to find a caretaker for the UNESCO contract, the Warlukurlangu Art Centre in Yuendumu agreed to hold it for the Lajamanu artists from their CD-ROM royalties until their own art centre was re-opened. The collective discussion with the families of the 50 original artists revealed that it was symbolically extremely important to distribute 50 cheques so as to confirm the copyright of the contributors. There were 10 old men and some 15 women at this meeting, which was filmed. For most of the deceased artists, they collectively designated an heir who was not a son or a daughter, but a grandson or a granddaughter living in Lajamanu or in another Warlpiri community like Yuendumu or Willowra, or in towns like Katherine, Tennant Creek, Alice Springs or Darwin. This was very moving for me, because I had seen these young people as babies or children in camps in 1979, and some came to me to express their own emotions: 'You grew us up living in the camp with our old people, and we are carrying that thing now…'

Why did these elders decided to 'jump' a generation? One reason was to give the responsibility to young people aged between 20 and 25 because they can read, are used to travel, are parents themselves, teach at the school, know how to use new technologies or have other skills. One was even training to be a policeman. It was important for the elders to recognise these young people as caretakers by officially telling them, 'You have to carry the law. You are responsible.' This is interesting, because this choice to recognise young people shows an adaptation of current priorities at Lajamanu to saving Warlpiri culture. In 1979 the law leaders were upset that some young people who wanted to learn the law were spending a lot of time doing other things, such as training for jobs, and going to many meetings to negotiate land and mining deals, and would not spend enough time learning their own hereditary knowledge in the camps during rituals and in the bush.

With time, the Warlpiri have adapted a lot of things; for instance, regarding marriage. Until recently, during a boy's initiation, *kurdiji*, a girl of his age was betrothed as his future mother-in-law, and from that day he could not speak to her or any women having the same skin name as her. Since the 1980s lots of teenagers have had love affairs and children at an early age without respecting the kinship principles that forbid them to marry and have children with somebody carrying the same skin name as oneself, one's mother, or a male's mother-in-law or a female's son-in-law. Wanta Patrick Jampijinpa (Wanta Jampijinpa et al. 2008:15, note 17), with his concept of the Milpirri Festival, has iconised the four colours in an attempt to teach and protect the complexity of the traditional cosmological classification of the four skin name groupings:

> The skin names have been colour coded so that they relate to the dreamings that are owned by each group. N/Jakamarra + Na/Jupurrurla are red because they are custodians for the red kangaroo and many other land animals. N/Jampijinpa + N/Jangala are blue because of the primary importance of the rain dreaming.

> N/Napaljarri + N/Jungarrayi are yellow because they have many bird stories and star stories. N/Japangardi + N/Japanangka are green because they have many plant stories like the bush potato, which is very important and has very green leaves. In Lajamanu it is common now to hear kids refer to skin as the green group, yellow group, etc. This is a modern interpretation of an old system. As Wanta says, *'The colour coding gets them started, then they can learn the other relationships'*.

The colours of costumes that dancers wear at the Milpirri Festival are determined by their own skin names, much like the colours of uniforms in sport teams. Wanta Patrick Jampijinpa has also produced plastic bracelets, which are given to children and adults according to their skin names as a way of helping them to identify the traditional rules that organise the whole cosmos. Skin names are attached to all animals and plants, and other things like rain or fire that identify Dreamings and places. Interestingly, plastic bracelets, popular in the Western youth cultures, were forbidden in Brazilian schools because some children, not knowing the colour code, were wearing bracelets with a colour that identified them as 'free for sex' (pers. comm. from Brazilian friends). In the Lajamanu case, the four skin colours also carry a message in terms of courtship and potential sex, but only as an attempt to prevent the wrong choices, as the traditional skin name classification determines from which group one can find a spouse, with the other three groups being forbidden to even have love affairs. People who carry the same skin name are considered as skin brothers and sisters, and cannot flirt because this is considered incest. The coloured bracelets thus remind children which member of the opposite sex is or is not allowed to be a potential spouse, or even boyfriend or girlfriend. For Warlpiri, therefore, the way people marry preserves the balance among all the Dreamings, the fertility of related species, and the general wellbeing of the society and the land.

On 18 January 2008 a group of lawmen from Lajamanu recorded and posted on YouTube a protest against police who had interrupted a boy's initiation that they were organising on a restricted ceremonial ground. The video in English and Warlpiri, with subtitles in English, provides strong statements by lawmen asking why police cannot accept the sanctity of their sacred sites and law. It also provides an explanation of why the entry of a policewoman onto the initiation ground was a transgression of their law: the men's ground is forbidden to women precisely because it is the place where boys learn how to respect women (*Lajamanu and the Law* 2008). It took two years of discussion for the police to finally make an official apology to the Lajamanu community for their intrusion on this sacred ground. This event, like many others resulting from the Northern Territory Emergency Response or other discriminatory experiences, has provoked a mixture of anger, mistrust and despair among old and young generations alike. This potential for new ways of civil expression that call for responses and contribute to conflict resolution is an important aspect of the internet, especially when such initiatives are grassroots.

Experimenting with digital reticularity to change perceptions

When I went back to Lajamanu in August 2010, the Warnayaka Art Centre was run by four staff members, with lots of artists painting every day and workshops for children and young people.[13] It had several computers and one with a huge screen. I transferred onto this computer 90 hours of my 1984 Lajamanu recordings, which the linguist Mary Laughren at the University of Queensland had digitised as part of the Warlpiri Songlines project she was undertaking with Nic Peterson and Stephen Wild at the Australian National University. I also reinstalled the *Dream Trackers* CD-ROM in the school where PCs had replaced Macs, in the Council office, and in the new library jointly funded by Northern Territory Library and mining royalties to Lajamanu families.[14] Lajamanu was then hosting a Warlpiri Triangle meeting, which was also partly funded through mining royalties in an initiative to promote Warlpiri teaching in the three communities of Lajamanu, Yuendumu and Willowra. All of the delegates were Warlpiri teaching assistants and literacy workers who were very affected by the recent reduction of the bilingual schooling program to half-an-hour a week per class. Many were proposing to use more digital technologies to promote and teach their language to young ones. Teachers and other participants asked for the *Dream Trackers* CD-ROM to be put on the Northern Territory education server, and they found it an exemplary model for organising data. More than ever, I felt compelled to provide for students and teachers access to this Warlpiri knowledge via an easy web interface.

After several projects presented to UNESCO, which required important funding, I was invited to put my digital Warlpiri audio-visual material on the Online Digital Sources and Annotation System for the Social Sciences (ODSAS), which was conceived by French anthropologist Laurent Dousset as a participative platform to safeguard online collections from Oceania, including his Western Desert collection, Karel Kupka's fieldnotes from Arnhem Land, and data from some 30 other French researchers working in the Pacific. In July 2011, with Mary Laughren, I organised a workshop in Lajamanu to show the Warlpiri a sample of my online data and how they could use the system to annotate their photos (200 from 1984) and films (three hours from 1979), or transcribe stories and songs (90 hours from 1984). The photo set was made accessible publically, while other sets required the use of a password. I photographed and filmed the annotation process, which met with enthusiasm from different generations. Back in France this audio-visual documentation was put online as a public set.[15] It demonstrated young people writing names of the relatives that they recognised on the photographs; Elisabeth Ross Nungarrayi transcribing in Warlpiri a myth told by a deceased ancestor; Jerry Jangala dictating to Mary Laughren the transcription and translation of a ritual song; or Henry Cook Jakamarra, more than 80 years of age, singing a 1984 ceremony he had not practised for years with striking concentration and gesture animation — and continuing to sing the cycle once the recording stopped.

In 2012 I was able to add a thousand photos and link to some Warlpiri songs and stories English transcriptions and texts I had used on the *Dream Trackers* CD-ROM. Another trip to Lajamanu allowed Mary Laughren and me to test again the ODSAS system so as to improve the interface (Figures 1 and 2). Many Warlpiri people gave us USB keys to upload photos so they could watch them at home on their PlayStations as very few have computers at home to access the internet.

Internet access in Lajamanu is a problem: each collective service (Northern Territory Library, school, council, shop, hospital, art centre etc.) pays providers for its internet connection but Warlpiri households are asked to pay a $250 subscription per month or to buy connection on credit through Telstra. This is contrary to the whole idea of free access to knowledge and the reappropriation of their archival material. An Aboriginal community of less than a thousand inhabitants should have free WiFi for all, instead of multiple subscriptions. Another problem is access to computers, maintenance and training. Many young people — and even children — are very good at browsing computers (they also use Facebook on their mobile telephones) but with the reduction of the bilingual Warlpiri curriculum, teenagers and some young parents

Figure 1: Warnayaka Art centre, Lajamanu, August 2012: Shannon Nampijinpa annotates a photo of her father, Joe Long Jangala, during a *Kajirri* trip in Docker River, 1984. Copyright B Glowczewski

Figure 2: Lajamanu Library, August 2012. Warlpiri digital archives (from left to right): Juddy Napangardi is watching a DVD of her tour in Europe (with Denise Napangardi, Rebecca Napanangka and Agnes Napanangka for exhibitions in Paris, Berlin, and the Brave Festival in Poland, June 2012); Julieanne Ross Nampijinpa is documenting the ODSAS Lajamanu collections (1979–2011); Rebecca Napanangka is watching the *Dream Trackers* CD-ROM (2001) produced with 50 artists from Warnayaka Arts. Copyright B Glowczewski. See also Louw 2013.

are unable to write in Warlpiri and many cannot properly write in English either. The Northern Territory Library was very interested in 2011 to use the Warlpiri collection on ODSAS as a tool for computer training but it has not been organised yet because of a lack of staff, which — like in many other communities of the Northern Territory — does not allow for someone to even open the Library and let the Warlpiri use the community computers, which are partly funded by their own royalties. The situation is not due to a real lack of money but to the disempowerment of communities through the Northern Territory intervention and the new shire system that does not allow them to manage their community as they would like to (for instance, by employing two or more part-time staff members to share the same job rather than one full-time position that no Warlpiri can really assume when there are so many meetings (mining, funerals etc.) to attend all the time).

Transmission of Indigenous knowledge, digital and other forms of cultural education (Nakata 2007), and the digital anthropology I engage with (Wesch 2007,

2008) are not about mapping heritage and strategic data onto a Google map, but, rather, about allowing new social practices of sharing, as advocated by Guattari, that empower the people involved. It is collective intelligence that is at stake, which is understood as a collaboration between actors at the intersection of cultures and disciplines. This is a 'connected intelligence' according to the ethics of De Kerckhove (1997) and Pierre Lévy's (1994/1999) pioneering insights.

This ideal echoes Curtis Taylor's visionary statement at the 2010 ITIC Symposium: 'We have a dreaming like our elders: in the mind; digital technologies.' The 'we' he puts forward here in representing his generation echoes both Martin Luther King's speech of 28 August 1963, 'I have a dream',[16] and the title of Stanner's 1979 collection of essays, *White Man Got No Dreaming*. This progressive rise of black consciousness across such discourse, and international recognition for transnational Indigenous solidarity, has opened new 'Dreaming networks' that can inform the use of digital technologies in ways that can foster new forms of dialogue and a better future, including for social justice.[17]

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Notes

1. This plenary session identified key issues relating to information technologies and Indigenous communities. These have been compiled into a statement (AIATSIS 2010), which is now available on the AIATSIS website.
2. Following his role as filmmaker for the exhibition *Yiwarra Kuju: The Canning Stock Route* (National Museum of Australia, 2010), Curtis Taylor, together with Australian artist Lily Hibberg, created The Phone Booth Project, commissioned for *We Don't Need a Map* (Fremantle Arts Centre, 2012; Musée d'Aquitaine, 2013). He was also invited to Brazil.
3. On Agency debates, see Ortner 2006 and Otto 2005.
4. See, for instance, the world success of the Warlpiri-language film *Samson and Delilah* (2009), by Aboriginal filmmaker Warwick Thornton.
5. Quote from my PhD in French (1988) published in 1991 (see Laughren 1993) and translated by Deborah Rose (2000).
6. See his work with Eric Michaels (1987) and also the *Bush Mechanics* website at <www.bushmechanics.com>.

7. This process was described and demonstrated in a paper I gave at the 2001 AIATSIS conference that was published as a chapter of an AIATSIS e-book (Glowczewski 2005b).
8. This marked the entry of Aboriginal art onto the international contemporary art stage. The 12 Warlpiri men were guests of the exhibition *D'un autre continent, L'Australie: Du rêve et du réel* (From Another Continent, Australia: Dream and Real) at the Museum of Modern Art, in Paris, which showed a large selection of contemporary Australian art; at the theatre of Peter Brook, 17 dancers from Arnhem Land performed before the Warlpiri dance (Glowczewski 2010).
9. Our collaboration followed on from John Stanton's own involvement in contributing to the making of the *Moorditj* CD-ROM, an encyclopaedia of 100 Aboriginal artists, which was freely distributed to hundreds of schools around 2000.
10. His testimony is recorded in proceedings released on a CD-ROM with the United Nations Charter to promote Cultural Diversity (Glowczewski et al. 2004).
11. This project is documented by Joe Gumbula (2005). See also Jessica De Largy Healy (2008, 2011), who has been working with him since 2003, when she volunteered for the Galiwin'ku Knowledge Centre while researching her thesis. On Yolŋu reappropriation of knowledge, see also film by Barker and Glowczewski, 2002.
12. See lesson drawn in sand by Wanta Jampijinpa 2006. About Wanta Jampijinpa see also Glowczewski et al. 2008.
13. See their film posted on YouTube (*Lajamanu Keeps Culture Alive and Builds Business* 2010).
14. The CD-ROM is still readable on PCs, but not on Mac OS X. The French Musée des Confluences in Lyon funded an attempt to automatically convert the programming of the CD-ROM with Director software to its latest version working on Mac OS X, but it did not work properly. Many CD-ROMs are in this situation and the only solution is to reprogram in another format, preferably open source, so there is no risk to safeguarding again. The issue of saving our data and programs of linkages in formats that can be easily converted has inclined most of the research community, and archive and academic institutions, to push for this development of open sources.
15. Available on the ODSAS website at <www.odsas.fr/scan_sets.php?set_id=752&doc=78224&step=6>.
16. See the original film of Martin Luther King (*Martin Luther King I Have a Dream 1963 Part 1* 1963).
17. Following the violent death in custody of Cameron Doomadgee or Mulrunji in November 2004 on Palm Island, the acquittal in June 2007 of Senior Sergeant Hurley, who had been charged for this death, and Lex Wotton's trial in November 2009, as the leader of the ensuing riot, a campaign of support spread across Australia. Some protests were filmed and posted on YouTube. In July 2010 Lex Wotton was released, but with no right to speak to the media or in public meetings. Vernon Ah Kee, an Aboriginal artist of international renown, produced an art installation in support of Lex Wotton at

the Milani Gallery in Brisbane. It included film footage shot by the police during the 2004 Palm Island riot that followed the death of Mulrunji. A month after the closing of the exhibition, the artist was interviewed on the *7.30 Report*, and this footage was presented on the ABC as the first publicly available police footage of the incident. This footage, which I analysed in *Guerriers pour la Paix: La condition politique des Aborigènes vue de Palm Island* (Glowczewski 2008), was shown publicly in the Courthouse of Townsville during the committal hearing of the rioters, where many journalists were sitting to report. They commented on some of it at the time in local and national newspapers, but it is as if the meaning of these images was suddenly making another impact when exhibited by a famous artist known for his critical approach to colonial history and social injustice (Glowczewski 2007).

Chapter 7

Teaching from Country: Connecting remote Indigenous knowledge authorities with university students around the world

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Abstract: *The Teaching from Country program, originally funded by the Australian Learning and Teaching Council, enables university students around the world to learn directly from traditional knowledge authorities on their traditional land in remote places. In this chapter we report on our Information Technologies and Indigenous Communities (ITIC) Symposium presentation in Canberra, and tell the story of how we planned, configured and implemented socio-technical arrangements for the Yolŋu Studies teaching program, and then brought people together from Arnhem Land and around the world to a seminar in Darwin, where we worked together to discuss and document what we had learned about place, technology, and Yolŋu and academic knowledge practices.*

Teaching from Country

The Teaching from Country program at Charles Darwin University (CDU) brings together Aboriginal knowledge authorities living in remote Yolŋu homeland centres in north-east Arnhem Land with university students in Darwin and around the world. We use new digital technologies — laptop computers, G4 modems, screen-sharing software and Skype — to involve Yolŋu elders 'on country' in the university's Yolŋu Studies teaching program.

What follows is a story of our work and what happened when we were invited to Canberra to speak at the ITIC Symposium in 2010. We began our presentation with an acknowledgment of the warm welcome to country we had been given the day before by Matilda House, a traditional custodian of the land around Canberra, which was itself a powerful example of using digital technologies to make, signify and celebrate her connections to her country and its people.

Four of us visited Canberra. Yiŋiya Guyula is a Liya-Dhälinymirr man from Badaypaday in north-central Arnhem Land, and is the Yolŋu Studies Lecturer at the Australian Centre for Indigenous Knowledge and Education (ACIKE) at CDU. Dhäŋgal Gurruwiwi is a Gälpu elder, whose land is further east, and lives on her ancestral land at Birritjimi on the Gove Peninsula between a huge bauxite processing plant and the mining town of Nhulunbuy. John Greatorex is the Coordinator of Yolŋu Studies in ACIKE and is a fluent speaker of Yolŋu languages. He lived for many years at Galiwin'ku and maintains strong relationships with Yolŋu in homelands and towns of east Arnhem Land. Finally, Michael Christie has worked with Yolŋu and their languages since 1972, and works closely with the co-authors and many others.

Christie introduced the Teaching from Country program to the Symposium in Canberra, showing some video footage of teaching sessions from remote places in Arnhem Land, and talking about some of the theoretical work that went into and came out of the program. CDU has a long history of collaborative engagements with Yolŋu knowledge authorities, including the development of the Yolŋu Studies program, which was set up in 1994 in what is now ACIKE. This program won the Prime Minister's Award for Australia's Best Tertiary Teaching Program in 2005, and sits within a rich diversity of teaching and research that recognises and implements Australian Indigenous ways of making, sharing and governing knowledge within academic contexts. We take seriously the notion of mutual benefit as underpinning our university's Indigenous community engagement practices.

Research that preceded and underpins the Teaching from Country program includes work on the role of digital technologies in the intergenerational transmission of traditional knowledge,[1] the use of digital technologies for the long-term sustainability of remote Aboriginal homeland centres[2] and the professionalisation of Yolŋu researchers — consultants in articulating a research methodology that remains faithful to both academic and Yolŋu knowledge practices.[3]

When the Australian Learning and Teaching Council awarded Christie's team a National Fellowship in 2008, we were in a good position to develop an exciting teaching program in which Yolŋu elders who wanted to stay on their own traditional lands in remote places could participate in university-level teaching using information and communication technologies (ICTs). We were funded to engage some key Yolŋu as lecturers, a group of Australian advisers and some international experts on the sociology of technology and computer-supported co-operative work. We all came together to visit Arnhem Land and held an international seminar there in July 2009.

We were determined from the outset to ground our work in the Yolŋu philosophies of knowledge, place, pedagogy and technology, so we began the program with a workshop in Darwin. Yolŋu knowledge authorities came together to explore new digital technologies, to play with making digital objects and websites, to experiment with remote communication technologies, and to discuss what these might mean for our understanding of Yolŋu and academic knowledges and pedagogies.[4] We agreed to address five key challenges:

- What is a helpful conceptual framing of issues involved in our work that is valid in Yolŋu terms and supports translation into academic contexts?
- What are the best socio-technical arrangements for us to put in place?
- How do we understand and support the emergent order of remote Yolŋu pedagogy?
- How do we situate Aboriginal teaching in the academic institution to ensure that Yolŋu are fully recognised and paid properly for their contributions?
- How do we ensure that Yolŋu intellectual property is safeguarded through both traditional Yolŋu law and the Australian legal system?

When we felt confident in the technology and that we knew what we were agreeing to do, and when we were confident of the support of senior community members, we set up and implemented a dizzying range of socio-technical configurations between some very remote Arnhem Land sites (Figure 1) and at the university. Our task was to establish and then understand a new distance Yolŋu pedagogy for languages, culture and the arts. We developed a website to make these processes public and transparent while preserving their complexity and respecting Yolŋu ways of producing, sharing and safeguarding knowledge.[5]

The Yolŋu Studies classes at CDU are held on Tuesday and Wednesday afternoons, and from the beginning of March until the end of May 2009 we set up more than 20 teaching sessions from remote places to the Yolŋu Studies class in Darwin. Each of these sessions was recorded, transcribed and translated, and the videos and transcriptions uploaded to the website.[6] The videos and their transcriptions reveal the thrills, as well as the frustrations and disappointments, of connections and 'drop outs' as the program expanded, as the teachers ventured further and further from their remote homes, and as we began to interact with interested students of biodiversity ethics in California,

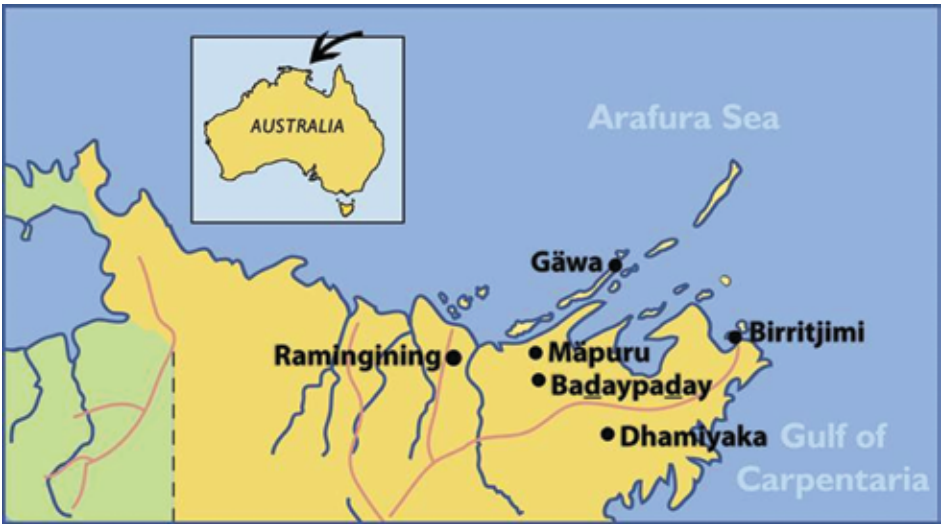

Figure 1: Sites of Teaching from Country (by Trevor van Weeren)

students of Australian languages in Japan, and, more recently, anthropology students in Queensland and at Columbia University in New York.

Teaching from country using ICTs seems to make for a whole different knowledge practice with connections and reconnections with new and ancient epistemologies. According to Yiŋiya (Guyula 2010:19), Teaching from Country is:

> different to the education you get in the classrooms because the classrooms don't talk to you. We're learning out there under a tree, we're learning out there in the bush walking around, the trees are always communicating with you. The hills, the land, the air are always communicating, teaching you, and understands every need that Yolŋu children have to go through.

The land, in other words, has a particular agency in the work of 'bringing up' Yolŋu children in the knowledge of their environment. We showed a video clip from an episode in which Yiŋiya was teaching from a sacred well on his ancestral land at Dhä-Miyaka, together with his older brother and some younger men, to students of Indigenous spirituality and environmental ethics in Santa Clara University in the United States (Figure 2). Here is a transcription of part of the sound file:

> This is my older brother, his name is Galaŋarawuy. Just wave if you can. [The students wave. Galaŋarawuy waves.] He's the senior custodian and landowner of this particular land. We're standing in a sacred waterhole which is towards over there…It's very, very deep with a bit of jungle and a waterhole. The story here is

about the ancestors that walked all the way from the east [Yiŋiya waves the video camera to the east], landed in a canoe, and they came over, and the story our old people has is about the sacred waterhole here which was struck by a sacred digging stick by the two sisters and out came the bubbling water.

[Galaŋarawuy then tells his story in the Djambarrpuyŋu language, which Yiŋiya interprets for the students.] This place is called Dhamiyaka and it's mine…This is a sacred place…Our two ancestors called the Djaŋ'kawu created this land…

[Later, Yiŋiya adds] When I'm teaching in the uni or going out to places teaching either through a website through Skype and taking people to sites, I don't do it under my own control or authority, I always let my old people know, the leaders of my clan so we all agree and it's something we use for the next generation for the future. So I always consult with my people before I actually go and do something. So that's the way it's going to be, that's the way it always has been. It is the final senior leader in the clan gives us the final authority to go ahead and even to go ahead and conduct the ceremonies, it's got to be under his power.[7]

Figure 2: Yiŋiya Guyula (right) with family members teaching from Dhä-Miyaka to Santa Clara, California, May 2009 (photograph: John Greatorex)

Teaching from Country allowed Yiŋiya to depend upon the authority and agency of the environment — the trees, the breezes and the water — as well as the authority and agency of his elders and support from his younger clansmen.

The focus of Dhäŋgal's teaching sessions was often more upon connectedness with family and the environment as a source of knowledge. We showed a video of a teaching session by her home at Birritjimi just a few days before we went to Canberra for the ITIC Symposium. Here is how Dhäŋgal commented on the video in Canberra:

> That's my brother Djalu. Everyone in the world knows him, he's playing in Italy at the moment, he's playing a *yiḏaki* 'didjeridu' [music sounds in background] throughout the land and back to where we live, that's the 'home journey' of the *yiḏaki* that I told the students. [She had been telling the story of how the sounds of the different *yiḏaki* echoing across the country reveal the connectedness of various related clan groups.] And this other one is my nephew, Vernon, who has taken up playing that music. He's now eighteen, but he picked it up when he was small. And you can see my little grandson standing on my brother's side there. So that's the whole story I told the students. The families are curious about what's going on, and I took my laptop and sat outside where I normally sit and talk with my families and I said, 'This one is interesting.' So everyone had a look to see what's happening, and I told them to 'Hello' to the class that I was talking to. And the kids are very curious about it, so that has given them the opportunity to know what is happening with technologies nowadays.[8]

Yiŋiya's philosophical and pedagogical position has been concerned with the role of the environment in knowledge work, while Dhäŋgal emphasises the role of connectedness as kin within and between clan groups and places. When asked what she felt she wanted to teach the students from her remote homeland, Gikal, she said, quite remarkably, that she wanted 'to teach them who they really are'. Here is an excerpt from an interview with Dhäŋgal (DG) by Christie (MC) in English:

> MC: And what would you be interested to teach about?
>
> DG: I'd teach students to really know about themselves, who they are and in ways of explaining through the Yolŋu side to see things which are good about what's within themselves. To know who each person really is, and what they can achieve from the teachings from the Yolŋu perspective.
>
> MC: And that's for Balanda [non-Indigenous] students as well?
>
> DG: That's for Balanda students as well. First of all they have to find out for themselves who they really are.
>
> MC: And…telling your story from Gikal will help them to do that?

DG: That's right.

MC: How?

DG: Because I'll be at home and feel that — what you would call — the power within. And any person that has the knowledge to pass things to other people that a lot of people miss out on by themselves, who they really are and what they should achieve.[9]

Dhäŋgal sees this work as crucially important in helping students to take themselves seriously, and to respect their own integrity as learners involved in serious and significant collaborations over knowledge and identity. Her position here is quite different from those understandings of knowledge that are embedded in most university teaching and research. The knowledge and identity resources of Yiŋiya and Dhäŋgal's traditional country have strengthened their ability to help students understand themselves.

This caused considerable interest among the non-Indigenous participants of our international seminar. They had watched the program unfold through our website and blog, and had visited Dhäŋgal in Gove and been taken on trips to homeland centres and to sites of significance connecting her Gälpu people with other clan groups around the country. When we all came to Darwin for the seminar,[10] we talked for three days with senior Yolŋu and other Indigenous researchers from around Australia, and with local and international non-Indigenous researchers and educators, about 'being a language and culture learner in a Yolŋu world' (Verran 2010:84–90) and the wider question of Balanda participation in a Yolŋu learning community (Ayre 2010). The Yolŋu participants spoke and wrote about contrasts between Yolŋu and Balanda education (Guthadjaka 2010), Yolŋu theories of child development (Garnggulkpuy 2010), and their relation to ancestral waters (Buthimang 2010) and sacred names (Gurruwiwi 2010). The international speakers at the seminar were all scholars of technology. Leigh Star (2010) wrote about what she had learned from Yolŋu teachers from her visit to Arnhem Land about herself, her knowledge, and about places, shadows and categorisation. Geoff Bowker (2010) reflected on the ways in which *all* knowledge is local, and Paul Dourish (2010) wrote on 'Computational thinking and the postcolonial in the Teaching from Country program'.

The students' feedback (see Clark 2010) made it clear that the feeling of *presence* was an important part of their experience. Each place is unique, with its particular ancestral story, its different connections with other people and places, and different owners and managers of its stories and ceremonies; and each moment is unique in the seasonal or daily cycle, and in the life of the community and its people. Thus, from each site emerged a unique and unstable socio-technical configuration of hardware, software, connectivity, spaces, images, elders, kin networks, children and passers-by. Some trial sites came together and connected to the outside world effortlessly, and others utterly resisted our best efforts.

At our Darwin seminar we also spoke about more practical issues like payment. Yolŋu participate in knowledge production in many complex and often hidden ways, from senior elders sitting silently in the background supervising the use of knowledge for which they are the ultimate custodians to young children who keep the technology going or act as go-betweens for elders who, observing kinship protocols, must not meet or speak to each other. It can be difficult to negotiate who should be paid and how much. Settling remuneration rates and processes will always be complex, provisional and subject to careful and respectful negotiations in good faith by experienced people. In this project, we negotiated with our university some new and culturally appropriate ways of paying people quickly and well for their knowledge and their participation (Christie 2010).

We also held a workshop centred on Yolŋu and Australian intellectual property laws, which differ and often appear to contradict each other. Teaching from Country changed that to some extent. We are continuing to explore the ways in which the use of digital technologies made our accountability under Australian law somewhat more complex and, within Yolŋu law, somewhat easier, and to ask what provisions we need to put in place to protect Indigenous intellectual property within both legal regimes (Guyula and Gurruwiwi 2010).

Then we addressed questions of ethics. How do we understand our accountabilities when we have startling new ideas about knowledge, where it comes from and how it is produced (Christie et al. 2010)? It was an exciting three days, and the discourses that emerged were published in a special *Teaching from Country* edition of the *Learning Communities* journal in 2010 (Christie and Verran 2010).

We are still working on these questions. Greatorex continues to work towards making the necessary complex socio-technical configurations come together. His key points at the ITIC Symposium were also to do with place, technology and authority:

> The Teaching from Country that we do in Darwin is based on Larrakia land, and so we need to be very careful and respectful to ensure that the Larrakia are happy for other languages to be taught on their country. Our work in Darwin followed a long permission process that Michael [Christie] and Waymamba [Gaykamaŋu], and other people followed through. When our students do start Yolŋu studies, they learn about kinship as the first part of their exposure and experience with Yolŋu culture. Then through that kinship, they then get a feeling and begin to understand why Yiŋiya says, 'I don't feel comfortable teaching in Darwin because this isn't my country. I feel quite uncomfortable.' And then they realise that not only Dhäŋgal [Gurruwiwi] here, and Yiŋiya, but people all around Australia have their own histories; their own lands. Then there's a respect that develops with all the students.

> The students in their evaluations gave very positive feedback because they saw that when they were watching the screens in Darwin, sitting there looking up like you are now, and they could interact, they were talking to the people, they felt through this window of the screen they were actually *with* those people. And when it happens week after week, they feel we're not actually in Darwin, we're actually being transported into this other location. And when they're talking, they're talking with people about events that happened right that day or happening right at that moment. So it's not contrived. So when they're talking to Dhäŋgal, it's personal and it's immediate.[11]

In summation, Yiŋiya puts it this way:

> It's the Closing the Gap…when I first came up with a computer, a laptop, and the cameras and I said there must be a way where we can communicate and educate the non-Indigenous people about there are spirits on the land, the images, the wind, the waters and actually standing on the land itself it empowers you to tell the stories, not only you are speaking but the whole land of our ancestors and the spirits of our forefathers…We're trying to use technologies and to educate our children where we can keep the stories, the songs, for our generations to come…for both our children later on and those who want to learn and to work with us so we can better understand each other about the land and the culture of the Aboriginal…We would like the non-Indigenous Australians for the whole community in the world to understand why we cry when we sing. When we tell a story on the land and the hairs on the back stand up. There must be spirits. It must be alive. That's the story we're trying to get across to people, that we understand, and the language and the stories, and songs that we sing are really alive and are part of us.[12]

Teaching from Country continues to put into practice what we have learned from Yolŋu elders and their country. After our ITIC Symposium presentation we thanked AIATSIS for inviting us to come and speak. We thanked the audience members for their interest and interesting questions. We thanked Lyndon Ormond-Parker for his friendly support, and the traditional owners of the land around Canberra for their welcome.

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Notes

1. See the Indigenous Knowledge and Resource Management in Northern Australia website at <www.cdu.edu.au/ik>.
2. See the Inter-Networking Communities website at <www.cdu.edu.au/inc>.
3. See the Yolŋu Aboriginal Consultants Initiative website at <www.cdu.edu.au/yaci>.
4. For details of the workshop see 'Notes from the Teaching From Country Darwin Workshop October 21–24 2008' on the Teaching from Country website at <http://learnline.cdu.edu.au/inc/tfc/trials01.html>; for transcriptions and translations of the Yolŋu philosophical work, see 'Papers by Yolŋu consultants' on the Teaching from Country website at <http://learnline.cdu.edu.au/inc/tfc/writings.html>.
5. The Teaching from Country website can be found at <www.cdu.edu.au/tfc>.
6. For a list of the trials, see 'Trials' on the Teaching from Country website at <http://learnline.cdu.edu.au/inc/tfc/trials.html>.
7. The video, *Trial 24: Yiŋiya and family speak with Keith's class in Santa Clara, California,* can be viewed on the Teaching from Country website at <http://learnline.cdu.edu.au/inc/tfc/trials24.html>.
8. An audio recording of the seminar can be found on the 'Conference papers' page of the AIATSIS website at <www.aiatsis.gov.au/research/conf2009/papers/CH3.2.html>.
9. The interview can be found on the 'Papers by Yolŋu consultants' page *(Teaching from Country, response from Dhäŋgal)* on the Teaching from Country website at <http://learnline.cdu.edu.au/inc/tfc/docs/TFC_Dhanggal_October_2008.pdf>.
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Chapter 8

Reversing the gaze: Considering Indigenous perspectives on museums, cultural representation and the equivocal digital remnant

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Abstract: *Partnerships between museums and Indigenous communities have a complex and fraught history. At the centre of these relationships are often questions around agency and intent, and an increasing expectation of privileging the Indigenous voice. Effective partnerships can provide a lens for the literal and figurative repositioning of the Indigenous voice in the museum space, and this lens is refocused to determine the capacity of these spaces to provide a platform for Indigenous representation.*

This chapter poses questions around museum and collections process and tools that support Indigenous agency as we move from object-focused display to social history-imbued stories in museum representation. It also asks some broader questions around the ownership of the physical remnants of our cultures and the potentially shifting and amorphous ownership of the digital, relocated and repositioned voice of our peoples in the national museum space.

In 2008, following extensive consultation and collaboration with major national museum and gallery agencies, the *National Standards for Australian Museums and Galleries* was released (National Standards Taskforce 2008). In recent years several other key documents on museum practice have provided guidelines for engagement with Indigenous communities, the acquisition and management of Indigenous cultural materials, and the related protocols of practice surrounding the presentation of materials in the museum space. These guidelines are often combined with, or include, a focus on the emerging role of digitisation and new media forms in these spaces of representation.

A desire to facilitate a reversal of the gaze, by encouraging and empowering Indigenous people/s and communities to participate in the active management of their cultural representation, is often framed as an aspiration of the museum space. In addition to exploring potential outcomes for this power shift and these new relationships, this chapter ponders how prepared the mainstream museum space is in actively engaging with these communities and in acting as a partner in the process of Indigenous representation.

The changing role of the 'new' museum as a museum of engagement and interaction, combined with the emergence of new media and digital representations, has presented particular problems in the representation of Indigenous communities and culture, and has raised a number of key questions. Can a remnant appropriately represent culture? Who owns the digital remnant? Who controls its use? Is it more appropriately displayed from and within a community, but accessible to the broader museum space? Will there be an ownership struggle over the de-accession of digital remnants when they are all that the museum space holds that represents a community or a culture? These key questions have become an even more complex issue due, in part, to the increased capacity of digital materials to be made available in a multitude of online and real-space forms, removed, rehoused, reinterpreted and refashioned in the realm of the museum, seemingly without a clear set of national guidelines that provide protection in their 'removal' from their community of meaning.

Museums in Australia and around the world are beginning to engage with new media to represent Indigenous cultural materials and stories in multiple digital forms through the virtual space of the web, and through interactive and new media forms within the physical or real-space of the museum. New media solutions can be used to deliver more appropriate approaches to representation; for example, by avoiding the relocation of sacred or community-based resources and instead providing a digital record of these objects represented in video, audio and image forms. These forms also improve the representation by literally delivering the voice of that community. Their portability also offers a strategy to deliver the material back to that community, either through online forms or through the reproduction of digital exhibitions outside of the physical museum. This has been demonstrated well by the Smithsonian Institution's National Museum of the American Indian, which maintains a vibrant program of co-operation with Native communities and museums managed within those communities and an engagement through reciprocal programs and training systems for Indigenous peoples throughout the Americas (NMAI Collections 2009).

At a time when there remain fractured relationships informed by the highly sensitive debates around the de-accessioning of human remains and sacred materials from collections and, in particular, the resultant return of ancestral remains, carefully managing future relationships between museums and communities is key to avoiding some of the policy decisions that positioned ethnographic museums as authorities over collections. A clearer understanding of what UNESCO has framed as 'intangible

heritage' items, which, through digital remnants, may be positioned and owned within a collection, will require a more even legal and power position for Indigenous peoples. If guidelines are required to facilitate a better understanding of how digital materials will be managed, a meaningful articulation can be found in Terri Janke's (2009) *Beyond Guarding Ground*, a text that explores the multiplicity of Indigenous cultural ownership protocols and issues beyond what has been traditionally accepted as ownership and location in the museum collection. The text promotes a position that digital materials are likely to be the mechanism of delivery from community to the broader population in the dissemination of performance, vocalisation, interaction in-country and other cultural Indigenous knowledges, and that communities retain a right over the iterations of this cultural material (Janke 2009).

The problem of collections and ownership becomes key in understanding who owns the remnant, and who creates a space of cultural management. Historically, that problem was moot as standard policies and practices of museums combined with property and ownership law held the museum as owner of a collection purchased or gifted to it. At a recent conference in the United States, a curator presented a photographic collection that his non-Indigenous institution held. The collection held a number of unique photographs of an Indigenous community at the end of the nineteenth century. He explained the positive steps in allowing contemporary Indigenous community access to the photographic materials in digital form. He was asked whether the community had requested these images to be returned and no longer used in the collection. He responded by explaining that his institution owned the images, and had the legal rights to show and distribute them according to their own collection policies and United States law. What rights do Indigenous communities have to request compliance where ownership of artefacts and objects of collection remain incontestable in law? What is the capacity or likelihood of a museum to entirely de-accession items to the extent that they no longer form a collection? With the capacious volume and reproductive potential of the digital image across more accessible media forms than the museum space, this will prove an even greater issue for both Indigenous communities and the museum.

In using the template of Edward Said's 'reversal of the gaze' as a means of 'strategic location' and repositioning of Indigenous identity as a central author in the process of review (Said 1979:20), I am beginning a longer-term study (supported by the Australian Research Council) into Indigenous representation through new media forms in national museum spaces. Central to the 'location' of the study is my own identity as an Indigenous Australian Wiradjuri community member and a worker in the field of cultural engagement. While this is a potentially risky and problematic position, as it locates me as a singular voice within the research, it is a cogent position in that it is frequently required by museums of their Indigenous curators. The role that Indigenous curators and consultants have in acting on behalf of the museum, as well as

giving voice to a community remote from the museum, is often layered with their roles in the broader, pan-Indigenous community, and sometimes by their disconnections.

The 'King Plate' was a colonial tool developed to inscribe individuals with a voice where none was necessarily authorised by their community. Those recipients of King Plates and their role in the post-colonial Indigenous collection act as a strong reminder of the risk involved when advocating as an Indigenous representative on behalf of a non-Indigenous organisation (Foley 2007) or when speaking globally on behalf of Indigenous peoples. The capacity for the Indigenous curator to avoid the difficult position of having a notional King Plate placed on his or her engagement in this dual role is a key issue to be explored further in this study and a key consideration in any reversal of the gaze that focuses on institutions as arbiters and authorisers of culture. To this end, the aim of attempting active reflexivity in the management of the study is to both challenge the notions of removed appraisal and, similarly, to encourage a further discussion around the capacity for any one Indigenous writer or researcher to respond in a pan-Indigenous manner.

As the Indigenous curator Djon Mundine suggests in his insightful 2005 *Artlink article* 'White face, BLAK mask [Apologies to Franz Fanon]', if the position is largely one where museums are forced to consider the broader visitor profile and the museum institution as vested interest, rather than the community being represented, then engagement will only truly be restored by eliciting the voices of Indigenous participants and practitioners. Mundine speaks of the difficulty in challenging the non-Indigenous voice that seeks to represent the Indigenous perspective, and suggests instead a voice and an approach that positions indigeneity at the centre of the engagement process.

By reversing the gaze and exploring these power relationships from an Indigenous perspective, there also emerges a third sphere of interactive space between the museum and the community. There is potential in this space to engage a meaningful dialogue around existing collections and materials, as has already been attempted through two contemporary spaces for online collections management: eMob and Ara Irititja.

eMob is an Aboriginal-developed online database that uses cultural annotation to contribute community knowledge to the provenance of Aboriginal materials held in foreign museum collections, and reveals the scope of the materials held to the participating Indigenous communities. (eMob 2009) As an Indigenous Australian–centred process that has sought out British collections, this project has been developed under the auspices of the collective Murray Lower Darling Rivers Indigenous Nations in south-east Australia with Indigenous and non-Indigenous partners working from outside these museum spaces. Through digital inscription of facsimiles of real-space objects, the artefacts are digitally relocated to their home communities, where further knowledge on the items' use and protocols of access may be ascribed. This process not only puts the power over the knowledge of the item back with the traditional owners, but enriches the collections of the museum by building knowledge around the collection and providing a resonance for further information on traditional

materials. It is significant that eMob has been able to provide a clear direction for the partnerships of this digital space, acknowledging all partners while understanding that the cultural information is likely to be enriched by the object's digital relocation back to community.

Ara Irititja, developed by the Pitjantjatjara Council, further explores the capacity for a community to remove material back into its own collection and to inscribe it and make it available in a manner appropriate to the materials and the community expectations (Ara Irititja Project n.d.). This project, developed with the South Australian Museum yet controlled and enriched by the community, has developed its own software that not only addresses the needs of annotation of the range of video, image and sound materials required by the representative material, but also allows different levels of access that is managed culturally.

The focus on both virtual spaces and technology-based new media outcomes evidenced by eMob and Ara Irititja also solves some of the key problems in re-ascribing an Indigenous authorship over collections to a community, particularly where that group is geographically remote or located far from the museum space and collections. The capacity for technology to be reproduced, issues around insurance and portability, and the capacity for exhibitions to be housed in substantially different spaces are some of the potential benefits of engaging new media *in situ* forms. It does, however, remain to be seen whether these preliminary strategies for the development of more reflexive inclusion and engagement that rely wholly on virtual strategies of viewing will be seen as inferior or simply as a different management tool.

Similarly, if the role of the national museum space is to position the ongoing relevance of Indigenous representation to the broader public, what role do these processes play in encouraging Indigenous people and communities to participate at the centre of the process without an adjustment to the goals of the museum space, or is this adjustment necessary and a core part of any agreement protocol?

These issues of adaptability to either the virtual or real-space negotiation are highlighted in recent scholarship on the role of digital media in Indigenous curatorship and the public archive that provides a lens on aspects of digitisation, navigation, ownership, and the need for reinforcement of policy and procedural requirements. This management of the viewer is reflected in the thoughtful work of Srinivasan and Huang's (2005) 'Fluid ontologies for digital museums', where they suggest that digital reiterations of physical resources may not be as simple as recreating the visual landscape of a gallery in a virtual context, while the appropriately many-authored *Indigenous Digital Collections* (Nakata et al. 2008) is a clear call to Australian archives to harvest materials appropriately. The complex issues of collection, ownership and rights management, and the specific issue of digitisation of culture and its management into the archive, posit a complex and potentially confronting situation for the museum space, which suggests that the requirements of the community may be more important than the policies of the archive, and that the importance of digitisation for Indigenous

communities is so present that it should take priority. These disparate commentaries on the digital space that community curatorship and the virtual museum may reveal have been explored in Richard Robins' (2008) 'Reflections in a cracked mirror', which highlights concerns for the way that Indigenous communities are displayed, managed into archives and made available in perpetuity. He poses the question of how a mainstream museum space can be utilised as a tool of cultural understanding by loading it with the purpose of developing a more reflexive museum practice. Are community members and elders treated as curatorial experts, and what role does the museum curator have in acting as an interlocutor between the two parties? Underpinning these discussions and these specific questions is the question, often invoked in the policy documents surrounding Indigenous engagement, of the role of the museum space in assisting communities in 'managing' or even 'safeguarding' their cultural materials.

In addition to contributing to the education of locally employed Indigenous curators, the Smithsonian's National Museum of the American Indian (NMAI), led by a Native American director, Kevin Gover, has contributed to the discussion of the power relationship and the role of community as equal partner by radically changing its way of managing and displaying its collection. The management cites the change in focus from static, historical collections to vigorous engagement processes and interactive programs by reminding the visitor that with 'continuing ambivalence about archaeology, there is little expectation for substantial growth of the archaeological collections' (NMAI n.d.). The NMAI charter to 'provide for Native American research and study programs', alongside its role as an agent of collection and research, repositions Indigenous people from a focus of study to a partner in the process (NMAI Act 1989). Its national exhibitions, like the recent *Native Words, Native Warriors*, use interaction and multimedia as reminders of the role that Indian code talkers played in the military (Schupman 2008). This presentation is available in dual modalities: both online and as a real-space exhibition. The nature of the reproducible digital form means that the exhibition can exist in several locations, and is concurrently touring the United States as an interactive and accessible exhibition that is re-housed in a range of different spaces. These forms reach a broader audience with fewer resources, and this delivery capacity has allowed the work to be shown in spaces that are closer to the communities represented in the exhibition.

The use of new media forms throughout the NMAI circumvents the risk involved in both the online mode and real-space domain that a collection of objects continues to represent a moment that remains frozen in time while a culture continues to change. Through the capacity for updating and capturing the contemporary and changing stories of Indigenous communities and peoples, communities become engaged in reinvigorating their own cultural representations. Further supporting this process and addressing some of the concerns of a pan-Indigenous representative voice, the NMAI's program of curatorship and research also identifies communities

as experts and addresses the difference of geographical areas within the museum structure by identifying liaison workers who represent that geographic area as the museum-based contact.

The issue of authorship and the present voice of community have also been played out in the online and physical space of the National Museum of Australia. Beyond the initial difficulties of a perceived overcorrection of Indigenous representation, the ongoing exhibition space of First Australians demonstrates a focus on a better understanding of contemporary and traditional Indigenous life, and in this way both invokes and challenges Robins' discussion of the Indigenous display as a tool of agency. The project challenges it, because it appears to have an Indigenous voice that aims to educate on Indigenous culture and life, thereby reinforcing the museum role of educator of indigeneity to a non-Indigenous audience. The material, however, does move beyond a historical view of Indigenous identity by creating an interactive dialogue on contemporary, traditional, urban and rural Indigenous lifestyles that suggests an Indigenous-centred perspective even where stories take up a specific position or representation. As in the 2009 exhibition *From Little Things Big Things Grow*, these moments are able to form a broader pan-representational role (Neale 2009). Arguably, this space is articulated more meaningfully because of the capacity of materials to be relocated through digital reproduction from community into this space of display, and their dual location on the website, with further stories and digital material that builds on what is available in the limited space of the museum, extends the context and scope of representation.

While Indigenous-identified and, to some extent, controlled spaces like the NMAI and the National Museum of Australia's First Australians gallery encourage a rethinking of authorship and protocols around representation, a key challenge remains how to manage this process in spaces where the Indigenous focus is less clearly articulated. Similarly, the risks and opportunities of the digital domain become pressing with the increased capacity for uncontained reproduction of digital materials through the internet. Tools like Janke's important ethical protocol guides produced for the broader arts industry and delivered by the Australia Council for the Arts (Janke and Australia Council for the Arts 2008), combined with her more recent, inclusive intellectual property treatise, *Beyond Guarding Ground* (Janke 2009), contribute a range of resources to scaffold a response to engagement that encourages museum policies to be informed by the broader Indigenous cultural requirements rather than their historical policies and practice. Similarly, the processes being proposed through the development of the Indigenous Australian Art Commercial Code of Conduct and the Indigenous communal moral rights legislation will be key tools in supporting Indigenous-centred perspectives (NAVA 2009).

The process of managing the digital image as a separate and reproducible item, and its potential as a process of showing and presenting culture without the removal and rehousing of objects, is a key aspect to the appeal of the digitisation and new

media models. The Indigenous voice of these processes may, however, be difficult to achieve from within the national non-Indigenous museum space, where internal processes and program management are also required to maintain the overarching voice of the museum. Where Australian and international programs of Indigenous engagement in the museum have been actively sought, these engagements have still positioned the Indigenous curator as primarily responsible to the museum, thus creating a tangible separation between the museum and the community being represented, with the curator positioned pivotally. The capacity for new media forms to relocate both the curator and the objects, and the themes of display, may help to break down the hold of the museum by literally removing the engagement from the physical space, by inhabiting that third space, and by potentially assisting in the reversal of the gaze in creating spaces where Indigenous communities can engage with a relevant museum and become viewers of that space in which they can explore their own and other cultural moments.

The Smithsonian's NMAI has clearly indicated, through its program development, that it will avoid a static view or construction of community and identity, a resolution that is aided by the engagement of Indigenous voices through the process but not always achieved in the developed program. Beverly R Singer, in discussing her engagement to work on *Who We Are*, a film commissioned for the 2004 opening of the NMAI, highlights some of the difficulties that can occur when, with the best of intentions, the showing space begins to dictate the capacity and means of the story to be told. She relates the importance of maintaining Indigenous authorship and engagement when this power relationship is unbalanced, as evidenced in the insider information she possessed, which ultimately protected cultural materials that would have been otherwise used (Singer 2005). The formidable space of the museum can take primacy over the process, and the digital space may be an opportunity of engagement that relocates the power by removal to a neutral zone.

As Nakata et al. (2008) have highlighted, the collecting houses are so behind in simply managing material into their archives, and so concerned with maintaining appropriate strategies, that they find it difficult to move beyond these pragmatic issues to realise the potential of Indigenous contributions and engagement. Arguably, Indigenous communities have become a problem to solve for archives and collections, rather than a relationship to develop.

Similarly, communities themselves may be concerned about the power and authority that nationally funded museums may hold. The return of remains to communities has been a hotly contested issue, as has the failure of the broader community to accept Indigenous interests in such matters.

Historical precedents — like the case of Kennewick Man, the 9300-year-old Indigenous person removed from a grave, who, in a moment invoking Solomon, remained with scientists when a contestation of Native Communities kinship to the remains could not prove tribal heritage — may inform a prevailing suspicion

that museums are more interested in their collections than the culture and community being partnered (Confederated Tribes of the Umatilla Indian Reservation n.d.). Digital remnants could be relegated to these same moments of decision and provability. The scientist and/or photographer is the holder of the copyright, the museum is the accepted authority that is able to prove provenance, and any dissenting Indigenous community without access to the same resources risks becoming marginalised as a partner in such a process. Projects like Ara Irititja become important in finding pathways of engagement that are reciprocal and edifying for both parties. The South Australian Museum has worked with the Pitjantjatjara Council cohort to share materials, the materials are validated and enriched by the association, and appropriate use or de-accessioning is a decision that has less risk and more opportunity for either party in a process that intends to show and display culture. If engagement and partnerships with Indigenous communities is a solution, then the NMAI's and the National Museum of Australia's primary focuses on story and explanation, more than the artefact of the past, may provide solutions for representation that fulfil Robins' claim of museum as culture stakeholder.

The discussion around inclusion and community engagement is just one more step (where there have often been missteps) in the process of managing Indigenous cultural materials and interacting with Indigenous communities. We are still, as Indigenous people, often not included in the most central of questions over policy and engagement, and instead relegated to consultation on isolated moments of representation. Museums, like any organisations, are necessarily difficult spaces to interrogate. The workers are encased in a small industry that relies on networks, connections and the integrity of the curatorship. Yet it is not the curator or director who makes an agreement with a community; it is the museum as historic entity, and museums change policy, staff and political position over time. Within this frame of the culture business, what capacity does a museum have to entirely de-accession its collection of disconnected artefacts and, where a collection warranting digital reproduction holds value, will the museum be bound by its own dictates to ensure that it retains a financially important collection?

If we are at a crossroads of opportunity in the cultural displays that the community has come to expect from the ethnographic museum space, then technology and interactive spaces, both within and outside museums, may provide solutions that provide benefits to both parties with greater accessioning in the archive; with more opportunities for accuracy, authenticity and enriched provenance; and with an extension of the museum space and a space of showing that is genuinely Indigenous centred.

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Chapter 9

The Ara Irititja Project: Past, present, future

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Abstract: *This chapter tells the story of one of the largest, longest running, and most successful community archival and digitisation projects in Australia. It discusses how Anangu (Pitjantjatjara and Yankunytjatjara peoples) of Central Australia have created and sustained the dynamic and responsive Ara Irititja Knowledge Management System and community archive through digital technologies since 1994. In the past, Anangu were photographed and their knowledge recorded and published without proper negotiation. Today, Anangu are digitally recording contemporary events for themselves, and incorporating these into their own community resources. Anangu are passionate about protecting their archival past, accessing it in the present and securing it for future generations. The Ara Irititja Project has made this possible.*

> *Today, I am thinking about why Ara Irititja is important. It is important for all our people, throughout the west, east, north and south to see their own history — for children, teenagers, young and old people, men and women to see and hear about their past.*
>
> *Missionaries, explorers and others recorded and photographed the lives of the people and took these records away. Ara Irititja makes it possible to bring the history back home where it belongs. To have Ara Irititja in our communities helps keep the past in the present and helps keep our culture strong. It is important to link future generations through Ara Irititja to generations past.*

> *Today, we live in the computer technology time. The computer has a huge brain and is very clever. It can hide things if necessary, and then bring them back later. The Ara Irititja computer is clever like a dingo (Wilton Foster, OAM, Chairman, Pitjantjatjara Council, 21 March 2005).*

The need for a digital archive

Over the past century, many visitors to the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands in Central Australia have collected and permanently removed artefacts, photographs, film footage and sound recordings. While some of these materials were filed away in the archives of public institutions, others were 'lost' in private photo albums or packed away in old suitcases and boxes. In rare instances where physical repatriation has been attempted it has been largely unsuccessful. It is often inappropriate for fragile materials to be returned physically to Anangu communities due to the vast distances between the communities and harsh desert environmental conditions.

Many of these materials were and are of great value and importance to Anangu on both personal and community levels. Family photograph albums owned by Anangu are rare, and difficult to preserve and maintain. Although digital camera use is now very common, similar issues about reproduction and conservation exist for this newer format. Institutional archives are inaccessible to most Anangu and the broadcasting of films or audio made by Anangu media organisations happens infrequently. Much of that material is of strong local interest, but does not meet the criteria of public broadcasters such as CAAMA, NITV and SBS.[2] Information provided by Anangu to outside researchers is not often returned in a useable format and remains largely inaccessible to Anangu in institutional libraries. The multimedia functionality of the Ara Irititja software helps to address all of these needs for the Anangu community audience.

About the Ara Irititja Project

Ara Irititja means 'stories from a long time ago' in the Pitjantjatjara language. The main aim of the Ara Irititja Project is to bring back home materials of cultural, historical and contemporary significance to Anangu, and to provide access to these materials in sensible and sustainable ways. The Ara Irititja Project is a community-based initiative that was designed at the request of Anangu communities. The Executive Board of the Pitjantjatjara Council guides the Ara Irititja Project. Through the Pitjantjatjara Council, the communities own Ara Irititja. The Project has conscientiously followed its brief from Anangu to preserve and give access to their cultural history, and to ensure that Anangu maintain control of this rich heritage.

As a community-controlled resource, Ara Irititja is structured around a dynamic and growing collection of materials and knowledge. Most conventional archival institutions manage comparatively static collections of historical materials. Ara Irititja is different. It responds directly to the needs and expectations of community members. The project team acts upon feedback received directly from Anangu either during visits to the communities or through personal or telephone contact.[3] Over the years, this has meant that strong bonds and close relationships have formed between the archivists, historians, anthropologists and linguists in Adelaide and Alice Springs and Anangu community members. Ara Irititja is both cross-cultural and intergenerational.

Growing the idea

During the 1980s the idea for a community archive began to take shape in the minds of many Anangu and a few people working with them. In 1986 schoolteacher Ron Lister spent a year locating photos and archival records and contacting former missionaries and others with collections of old photographs, home movies, letters and sound recordings. Slowly, the idea began to grow in different ways and a combination of events drew everyone together. In 1991 archival consultant John Dallwitz prepared a historical photographic exhibition to celebrate the tenth anniversary of Pitjantjatjara land rights.[4] These historic photographs displayed outdoors at Itjinpiri, near Ernabella, were enthusiastically viewed by Anangu and stimulated the demand for a comprehensive search for historical materials.

In 1994 Anangu elders Peter Nyaningu and Colin Tjapiya, and the Pitjantjatjara Council anthropologist, Ushma Scales, came together with John Dallwitz to agree upon a name for what they were trying to do, and to seek funding for it. Ara Irititja was born and a Social History Unit within the Pitjantjatjara Council was created.

In 1994, inside a 'hand-me-down' black-and-white Macintosh computer, guided by Anangu, Ara Irititja began to construct its digital archive. By 2001 the first Ara Irititja computers were delivered to Anangu communities in South Australia, the Northern Territory and Western Australia. They were designed so that Anangu could navigate the digital collection, add information, stories and reflections, and use passwords to restrict access to specific items for cultural reasons. These functions facilitated the development of Anangu-centred histories and resulted in some unique functions and capabilities of the initial software.

Use on the communities

As of 2011 there were 67 Ara Irititja computers in Pitjantjatjara and Yankunytjatjara communities in South Australia and the Northern Territory, and in Pitjantjatjara and Ngaanyatjarra communities in Western Australia (Figure 1). Locations differ in each community according to the available infrastructure and locally identified

community-friendly spaces. Venues include schools, community offices, community art centres, community internet centres, tertiary education centres, a clinic, a women's centre, a training room, an aged care facility and the joint management office of Uluru–Kata Tjuta National Park. In Alice Springs Anangu can view Ara Irititja at the Pitjantjatjara Council Resource Centre, at an Aboriginal hostel that caters for Anangu who have had to move to Alice Springs to access renal dialysis, and at an Aboriginal secondary school.

Anangu secondary school students, who board at Wiltja Aboriginal Hostel in Adelaide, can view Ara Irititja at the hostel and at their school, Woodville High. A very popular workstation is situated at Ngura Wiru Winkiku Cultural Centre (Better World Arts) at Port Adelaide. Three men's prisons in South Australia also house Ara Irititja. Other communities that identify as Pitjantjatjara or Yankunytjatjara, as well as other Central Australian language groups, are interested in obtaining Ara Irititja.

Ara Irititja is proud that its work has been so well received by Anangu communities. Since the first digitising commenced in 1994, more than 100 000 multimedia items of interest have been added. Its success is largely due to its user-friendly software that accommodates local cultural priorities. When a computer is delivered to an APY community, the Ara Irititja team conducts two days of training to a broad cross-section of the community, including school students. Observations of people using Ara Irititja today suggest that a far greater number of people are competent at using the program than were initially trained. Anangu learn from each other how to navigate the computers. Often one person will manoeuvre the mouse while another controls the keyboard. In many cases, young Anangu operate computers for their older relatives. Ara Irititja may often be the first and only experience that older people have had with computers, and a respect is generated for the growing ability of the young operators. The mobile nature of the Anangu population ensures that people have exposure to Ara Irititja even if they do not have a workstation within their home community.

> I like looking at the olden times things that I don't know about. I like having the memory of my grandmother through seeing her in the photos, hearing the stories she tells and being able to look at her. I see the photos of me when I was a schoolgirl at Wiltja. Sometimes it's okay for family to have a look at their families who've passed away (Narelda Adamson, Anangu Tertiary Education Program, Pukatja, South Australia, 30 July 2003).

Anangu use Ara Irititja for entertainment while at the same time learning about family, country and heritage. Often different generations of one family sit together to search their family name to look at different members of the family. Older people will show the younger, 'This is your grandfather. This is your aunty. This is your *tjamuku kamiku ngura* [grandfather and grandmother's country]' or 'This is us mob singing with Ernabella Choir, performing *Inma* [traditional song and dance], or with that *ngintaka*

[big lizard] I got out hunting.' The features of newborn babies are compared in photos to their relatives who live across the desert: 'Look, he has his uncle's nose. She has her grandmother's hands.' Anangu can print out copies of their special photos and these adorn homes, or, if the family members depicted have passed away, they are hidden away in cupboards or suitcases to bring out at private times. Feedback from Anangu to Ara Irititja confirms how popular it is: 'You have to queue up to use it and then jump in quickly before someone else takes the seat' (Elsie Luckey, Imanpa, 5 May 2009). Once the seat is occupied, the operator also needs to keep a firm hold on the mouse in order to maintain control of the session. This has led to some novel data entry techniques.[5]

In March 2009 Ara Irititja provided a trial computer for the foyer of the Nganampa Health Council Clinic at Pipalyatjara, South Australia. This has been highly successful for both clinic staff and Anangu. The clinic staff members report that having Ara Irititja running by itself in a hassle-free manner is a great way to get people to come to the clinic and stay. The computer entices people who generally do not present to the clinic, makes people waiting for the clinic staff much calmer and patient during busy times, and provides child-friendly stimulation, which makes the clinic a much more non-threatening environment.

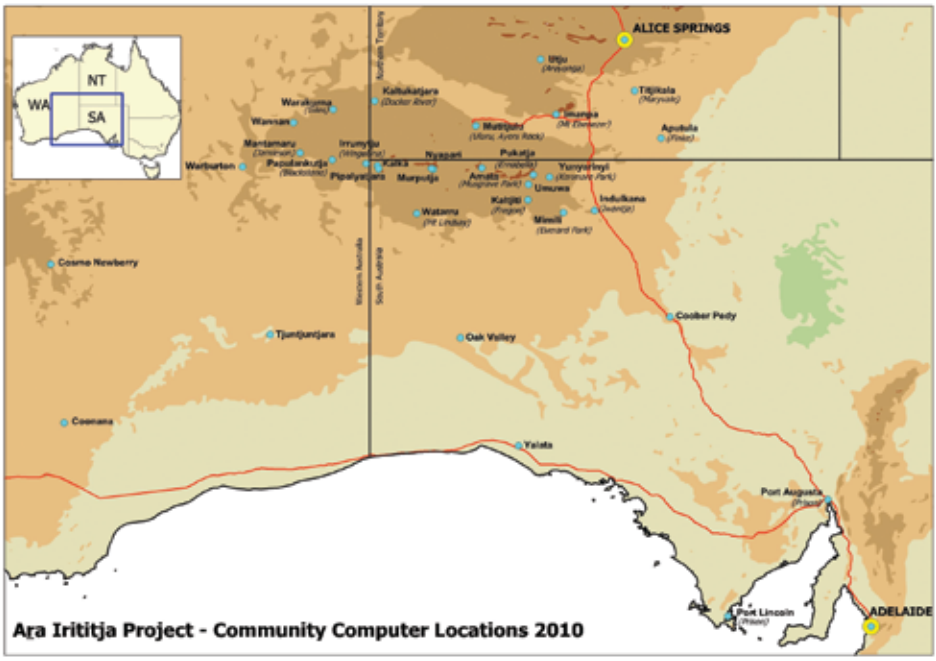

Figure 1: Location of Ara Irititja community computers in 2010 (image courtesy of Ara Irititja Project)

A living and growing archive

Increasingly, Anangu instruct that copies of footage taken at events must be lodged with Ara Irititja. These include such events as trips to culturally significant sites or cultural performances, sports carnivals and presentations at conferences. In this way, the archive is transformed into a living document that is constantly growing and responding to specific requests. Anangu regularly instruct Ara Irititja to search for particular people who they know possess private collections of relevant materials.

The recording of oral histories in Pitjantjatjara language is an integral part of the Project. Priority is given to recording, transcribing and translating the stories of elderly Anangu. In addition, extensive interviews have been recorded with former missionaries, government employees and community workers. Increasingly, people who have worked for Anangu contact the Ara Irititja team to inquire about sharing their material. Ara Irititja is often the first port of call for picture research for Anangu publications, including celebratory events and funeral booklets. It has also assisted with and contributed to many non-Anangu publications.

Anangu students, both at school and community-based tertiary institutions, have used Ara Irititja as their primary research tool for projects. Both from within the APY communities and, increasingly, from a broader Australian perspective, Ara Irititja makes a valuable contribution to the transmission of APY culture and history, and the consequent education of younger generations. The Project provides Anangu with a digital learning resource that is relevant, culturally sensitive and easy to use.

> I've seen Ara Irititja at Umuwa, too. Now it's in lots of places. I've seen it for ages now and I've learnt a lot about lots of places and seen how my family lived in the old days. My old mother: I've seen her naked, poor thing. I heard my dad singing, who's passed away, in the Ernabella Choir. I went with them to Sydney when I was a little girl with some of the other kids (Lisa Tjitayi, Anangu Tertiary Education Program, Pukatja, South Australia, 30 July 2003).

Ara Irititja identifies key people in the community with suitable cultural knowledge and skills to manage the community-based computers. This increases general computer literacy, keyboard skills and research experience. The Project offices in Adelaide and Alice Springs employ Anangu consultants on a casual basis, and increased funding to create additional positions for Anangu is currently being sought.

Importantly, at the community level, Anangu are able to add their recollections and record their knowledge into each community computer workstation. This information is then shared by all other Project workstations in South Australia, the Northern Territory and Western Australia. Thus, the Project has become a rich and dynamic repository of knowledge, and a powerful forum for reinforcing the strength

of knowledge for Annangu, some of whom live thousands of kilometres apart, in the present and for future generations.

Overcoming cultural challenges

For thousands of years Annangu have managed complex cultural information systems, which restrict access to some knowledge on the basis of seniority and gender. From the outset, the Arra Irititja software was developed in response to the specific cultural needs of Annangu, and integrated these cultural priorities into the design of its digital archive. Its innovative software protects and restricts access to private and sensitive materials, such as images of people who have passed away.[6]

Additionally, separate archives house materials that are restricted to men or to women. The Watiku and the Minymaku archives are independent of each other, and of the public Arra Irititja. They are separate databases managed and housed in separate locations, and require a series of passwords to access. The Watiku and Minymaku archives are only viewed by Annangu of appropriate gender and seniority. Each database has been given its own 'laws' of access by either Annangu men or women.

Annangu languages such as Pitjantjatjara and Yankunytjatjara are given priority and used in place of, or in addition to, English for on-screen text and command functions. Sometimes, the words used evoke living aspects of the Annangu world. In 2000 funding was secured for the design and construction of protective fibreglass units to house Arra Irititja computers, printers and projectors. The finished units were brightly coloured and resembled the shape of a Volkswagen 'beetle' (Figure 2). Annangu immediately named them *Niri-niri*, which is the Pitjantjatjara word for a scarab beetle — so named from the sound it makes when flying at night.

Arra Irititja is a private collection for Annangu and is not available to the general public. Arra Irititja does not consider itself obliged to provide non-Annangu researchers with access to its collections. Nevertheless, Annangu are keen for their stories and experiences to be given due recognition within the larger history of Australia. Research that is based on community consultation and carried out with due sensitivity is welcomed and supported.

Sometimes, this Annangu community focus can be difficult for outside researchers to understand. It is challenging for researchers to encounter a different culture of knowledge and access. Nevertheless, Arra Irititja has worked on many mutually beneficial projects, some of which are outlined below.

Regional partnerships

The Arra Irititja Project works collaboratively with many Aboriginal organisations across the vast APY Lands. These include all Annangu schools and tertiary education centres, the Ngaanyatjarra Pitjantjatjara Yankunytjatjara (NPY) Women's Council, the

Figure 2: Three generations viewing the archive in one of the original Niri-niri units at Mimili, 2007 (image courtesy of Ara Irititja Project; photographer: John Dallwitz)

APY Land Council, APY Land Management, PY Media, Ngaanyatjarra Media, the Nganampa Health Council, Ku Arts, and community art centres. Many of these organisations house an Ara Irititja digital archive and over the years have provided valuable feedback on database functionality.

Institutional partnerships and collaborations across Australia

The Ara Irititja Project team has negotiated several memoranda of understanding and developed working partnerships with public institutions across Australia that hold collections of archival and cultural material that Anangu wish to be repatriated. This 'virtual repatriation' is negotiated by the Ara Irititja Project team using its own software. As an integral component of some of these partnerships, the Project team and Anangu consultants have been contracted to assess archival material and establish protocols for cultural sensitivities within these institutional collections. This process also aids these institutions in identifying valuable material and providing reliable, accurate and culturally appropriate information about it.

At present, Ara Irititja liaises with and draws upon the archival resources of:

- South Australian Museum, Adelaide
- State Library of South Australia, Adelaide
- Lutheran Archives, Adelaide
- National Film and Sound Archive, Canberra
- National Museum of Australia, Canberra
- National Library of Australia, Canberra
- AIATSIS, Canberra
- Museum Victoria, Melbourne
- Strehlow Research Centre, Alice Springs.

In 2006 Ara Irititja began a partnership with the University of Melbourne to collaborate on information technology and art history projects. This collaboration is ongoing and has so far resulted in funding contributions for the development of new software and interviews with several senior Anangu artists, recorded in their own languages, with transcriptions in both Pitjantjatjara and English, for addition to the archive. It has also provided links to other scholars working at universities overseas.

The Northern Territory Library (NTL) established a very successful Libraries and Knowledge Centres program that included the original Ara Irititja FileMaker software, which it renamed Our Story. It successfully bid for a $1.24 million Access to Learning Award from the Bill & Melinda Gates Foundation in 2007, with the Ara Irititja software featuring prominently in the proposal. Since then, Ara Irititja and NTL have worked together to develop the functional specifications for new browser-based software. Supported by funding from NTL and incorporating feedback from the many users of the original FileMaker version, the Pitjantjatjara Council has developed its striking new browser-based system.

Collaborative partnerships

During the development of Ara Irititja, the value of collaborative partnerships has been clearly recognised. Mutually beneficial projects have commenced and these directions are being followed by Ara Irititja:

- facilitating APY elder men and women to advise cultural institutions such as AIATSIS, the State Library of South Australia, the South Australian Museum, the National Museum of Australia, the National Library of Australia, the Strehlow Research Centre, and the National Film and Sound Archive about the content and cultural sensitivities of related materials in their collections
- consolidating existing partnerships and pursuing new ones with Australian public collecting institutions

- pursuing joint projects and funding applications in already established partnerships, such as those with the South Australian Museum, University of Melbourne, NTL and the State Library of South Australia
- working collaboratively with institutions for the repatriation of publicly held family and cultural archival material, including men's and women's restricted items
- working collaboratively with cultural institutions to increase public awareness of Indigenous culture, including the presentation and exchange of culture through workshops and conferences.

Ara Irititja software licence

Recognising the suitability of this system for themselves, many other communities and institutions began to purchase licences for the Ara Irititja software. In 1997 the Ngaanyatjarra Council purchased a licence and, for the first time, the Pitjantjatjara interface was customised to include graphics and language of another linguistic region. In 2001 the Sisters of St John of God in Broome purchased a separately customised English language version of the software, and a small team of enthusiasts commenced what has become an acclaimed and highly successful project.

The Macintosh platform was initially chosen by the Pitjantjatjara Council for the Ara Irititja Project because of its ease of use, reliability and built-in multimedia capabilities. In 2003 enquiries were made to supply a Windows version of the software to the Koorie Heritage Trust in Melbourne and the Central Land Council in Alice Springs. This modification was made and, in 2004, NTL purchased a Territory-wide licence to deliver the Ara Irititja software into its Indigenous Libraries and Knowledge Centres as Our Story. The Pitjantjatjara Council further modified the software to facilitate customisation by its community users, and NTL used this function to personalise the interface for each of its distinct community language groups.

The requirement of community customisation was deemed crucial, because it was the original customisation of FileMaker software for Anangu that allowed the original database to attain a high level of community user acceptance and ownership in the first place. The Ara Irititja system 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 throughout the interface, such as in on-screen text, icons or buttons.

In recent years Ara Irititja has served as a model for both Indigenous and non-Indigenous groups outside of the APY Lands. The Project assists Indigenous organisations to maintain and promote their own cultural traditions. The Ara Irititja team has guided the establishment of a number of community history and language projects that draw on the Project's experience. There are now more than 30 separate language groups that are developing archives and knowledge centres using the Ara Irititja software. These organisations pay software licensing and training fees to contribute to

the financial sustainability of Ara Irititja, and they will all benefit from the results of the revised software. In the Northern Territory these organisations include the NTL Libraries and Knowledge Centres program and the Central Land Council, which hold multiple licences, the Tangentyere Council and Warlpiri Media. There is a successful program at the Sisters of St John of God in Broome, and assistance is also being given to the Martu History and Archive Project, the Wangka Maya Language Centre and the Juluwarlu community, which are all in Western Australia. In Queensland and Western Australia, the state libraries have also commenced pilot programs to support the development of regional community knowledge centres with the Ara Irititja software.

After many years of close collaboration, the Ngaanyatjarra Council and Ngaanyatjarra Media have contributed to the development of the new Ara Irititja software to build on its unique integrated Indigenous Knowledge Management System for the Central Desert language groups.

With the release of the striking new software, Ara Irititja is being approached increasingly to advise and assist with the establishment of new Indigenous cultural projects. Such requests are originating from a variety of sources, ranging from small family and community groups to large institutions that wish to establish a network of community-based knowledge centres. This interest has now spread overseas, and collaborative projects are being developed in New Zealand and North America.

Commencing a community digital archive

Through more than 20 years of experience, Ara Irititja knows there are many issues for a community or an organisation to ponder when it considers moving towards a digital repository of its heritage, culture and knowledge. Ongoing funding and sustainable management are crucial to the success of any project. Such issues include:

- the collection
  - What format is the material that you want to put in your collection?
  - Is it all digital?
  - Do you have original photos, slides, three-dimensional artworks, documents etc.?
  - Do you have sound items? What format are they in?
  - Do you have movies and video? What format are they in?
  - What other materials do you have?
- gathering new material and recording traditional knowledge
  - What recording equipment is needed?
  - Who will record the information and who will be recorded?
  - Will people need to be trained?
  - Where will you find archival materials relevant to your community?

- making the archive
  - Who is building your archive?
  - Who is administrating your archive?
  - Who is putting in the data?
  - Do you need material scanned? Who will be doing the scanning?
  - What equipment do you need?
  - How will you protect original, often fragile, material?
  - How will you deal with ownership, intellectual property and copyright?
- accessing the collection
  - Who will be accessing the knowledge centre and archive?
  - Do you need a standalone computer or a network of workstations?
  - Will you use the World Wide Web?
  - Will some material need restriction?

The Ara Irititja Project found that these are some of the more important questions to consider when thinking about establishing a community archive. There may also be other issues more specific to each community or organisation that need to be added. In launching such a project, one thing is clear. There needs to be a long-term commitment and a strong appreciation of the benefits that such a community-based undertaking will bring to future generations. Ara Irititja has survived to be the longest and largest community-based archive in Australia because of the dedication of its team members. The Ara Irititja Project is a holistic complex with the software being but one crucial element. Those aspiring to emulate the success of this project would do well to think holistically.

Building the original Ara Irititja software

The development of the Ara Irititja software commenced with a standalone FileMaker database created in 1995 by Greg Fidock. Martin Hughes took charge of software development in 1997 and has refined it in many stages since then.

Unlike many contemporary knowledge databases, the design of Ara Irititja commenced as a visual media-driven digital archive. At the beginning of the project, there were many thousands of photographs in various formats, hundreds of hours of film and sound, documents, books, magazines, diaries, and both two-dimensional and three-dimensional artworks. One of the earliest challenges was to locate archaic machines to operate the historic sound and film footage in order to begin the digitisation process. The software developer's instructions were complex: develop a database that handles different media, incorporates cultural restrictions, and is easy to use for an audience with limited literacy and, often, failing eyesight.

The composition of a real-world archive or museum collection was reflected in the software interface and the workings of the database. In effect, it was established as a

virtual museum with a section representing each of the separate media types. As with the archival storage folders and cabinets of the physical collection, the database storage remains divided into five sections: photos, movies, sounds, documents and objects. This approach facilitates cross-referencing between the items in the physical and virtual collections. It also enables the user-friendly interface to present the collection within a simple numerical catalogue framework, and thus simplifies both research and data entry processes. By fulfilling the brief to be easy to use, Ara Irititja demonstrates a successful, creative use of information and communication technologies that makes it unlike many existing museum databases.

The software interface invites personal interaction and participation at community workstations, with cultural and historical information being both distributed and collected through the Ara Irititja system. People of all ages are able to work together on an Ara Irititja computer. It is a family and community group activity that draws together people of several generations and encourages intergenerational knowledge transmission.

Embracing the future with revised software

For many years the Ara Irititja software team has been working on delivering a revised program using a browser-based platform, and the developer, Douglas Mann, has created a new and engaging contemporary interface (Figure 3). This will continue to expand its use as an educational, community-centred facility.

This browser-based software enables a highly creative approach to the delivery of the rich multimedia material into formal and informal educational systems. New features, based on the project team's experience and community feedback, further draw together family groups to actively participate in the creation of their own historical resources.

Moving to a server-browser platform makes it possible for Ara Irititja to be utilised more easily on banks of networked computers in schools and educational resource centres. For the first time, teachers have total classroom access to Ara Irititja in the schools, TAFE and tertiary education network systems.

The new knowledge management software

Ara Irititja's revised software is a leap forward from the limitations of the original stand-alone database system. Its server and browser configuration is suitable for Linux, Windows and Mac. It is ready-made for web and network systems if required. There are many new features, and a much greater focus on collecting traditional and contemporary knowledge. The 1994 'archival item' approach is still there, but as a component of a much broader knowledge-recording structure (Figure 4). Land management interests are well covered with data entry fields ready for the entry of

Figure 3: The Welcome screen for the new software draws selected images from the database and can be customised for different user communities (image courtesy of Ara Irititja Project; background photograph: Stewart Roper; logo design: Ina Scales)

scientific and local knowledge about animals, plants and the natural environment. Subsequently, this will all be linked into a geospatial system that is capable of accepting a community's own base map files and is ready to plot the occurrence of endangered species, fire events, and significant sites and other places of importance. The map interface will also provide Ara Irititja community users with an alternative site-based entry pathway into their massive collection of archival photographs, documents and multimedia.

A 'profile' approach adds a greatly expanded method of recording traditional Indigenous knowledge. The new software is set up with the capacity to create individual profiles under such headings as Collections, People, Fauna, Flora, Places, Events, Activities, Historical Stories and Mythology (Figures 5 and 6). Any of these profile types can be deleted, added and re-named to suit any community or language. The software is very flexible and is able to be amended and adapted to suit an organisation's needs. The system of profiles enables family history, genealogical and personal information to be accumulated within the knowledge management software in readiness for a full genealogy and family tree function.

There is an exciting new approach to playing and searching inside movie and audio files. There are also new ways to record information and knowledge directly into the database. In the old version, this function was limited to keyboard entry for text, and importing pre-recorded videos and sounds. If a computer has the requisite

Figure 4: The general screen layout for viewing a photo. The pictorial navigation 'ribbon' displays the results of your search for you to select from. The right-hand side grey panel enables data entry of names of people, creation of profiles, and recording and playing of 'annotations' (stories) (image courtesy of Ara Irititja Project; featured photograph: Bruce Edenborough)

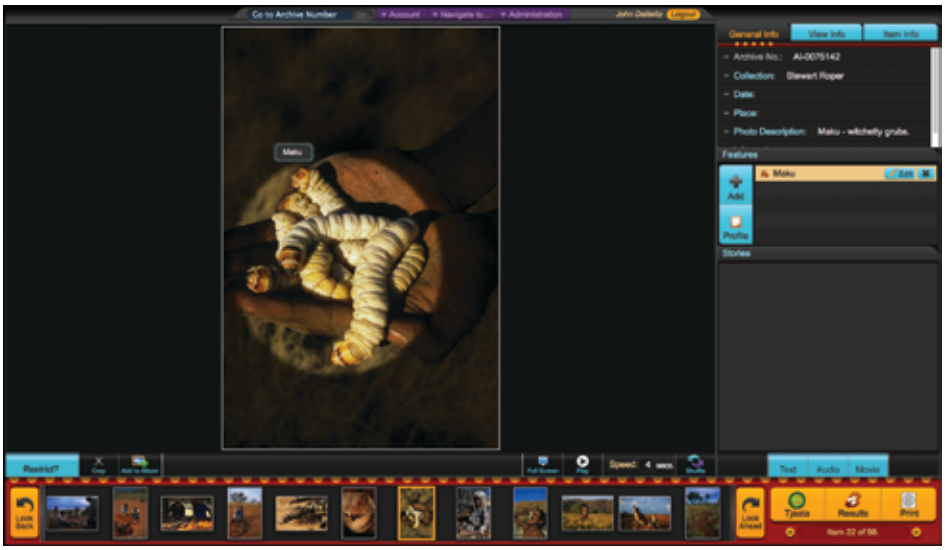

Figure 5: When a feature is created to link to a profile, it is highlighted when viewed and leads the viewer to the profile. In this case, the feature is the edible Maku (witchetty grub) (image courtesy of Ara Irititja Project; featured photograph: Stewart Roper)

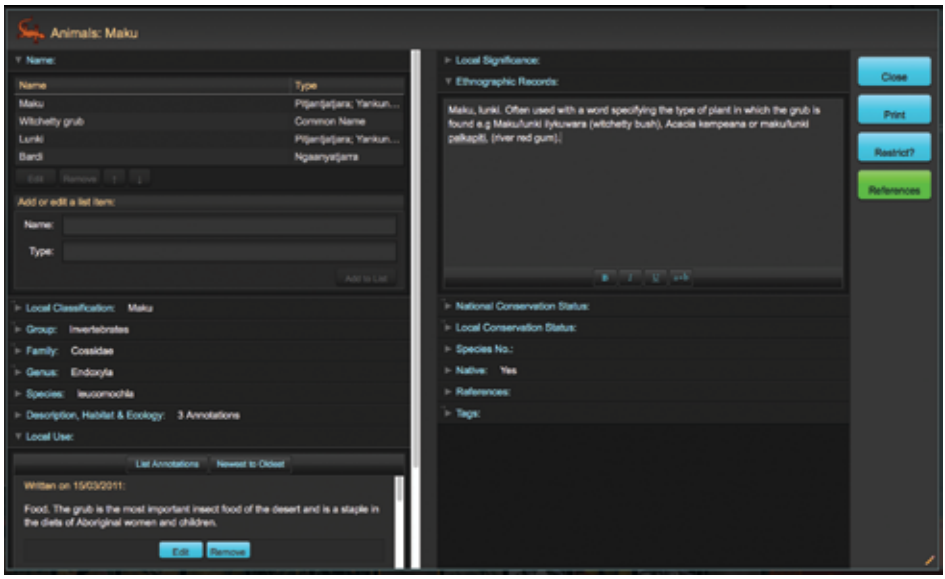

Figure 6: The Maku profile allows the entry of extensive scientific data, as well as local Indigenous knowledge and classifications. It also allows direct recording of stories as annotations to the profile, so that first-hand knowledge can be saved for future generations (image courtesy of Ara Irititja Project)

hardware capability, the new software enables the direct recording of 'annotations' or stories in audio and video formats. Thus, existing archived items, such as photos, movies, sounds and documents, are able to have personal comments and stories added to them by the database viewer. This can be done progressively over time and will build up a huge store of personal knowledge. Doing this by live recording enables Anangu elders, who may be reluctant to use the keyboard, to record their own knowledge in their own way and using their own words (Figure 7).

It is expected that existing users of the original Ara Irititja software will transfer progressively onto the new browser-based system. Down the track, as extended new functions, components and versions are created, a choice of licence upgrades will become available. Our own huge Ngaanyatjarra, Pitjantjatjara and Yankunytjatjara project has transferred all of its data onto the new software and, in 2011, was progressively introducing it to the participating communities.

If an organisation wishes to make more extensive changes to the look of the interface, it will be able to purchase a source code licence and contract a software developer to change it according to its needs. There would then be no limit to the graphical and functional changes that might be achieved. This would also enable larger institutions to integrate the Ara Irititja software with any compatible pre-existing programs that they currently use.

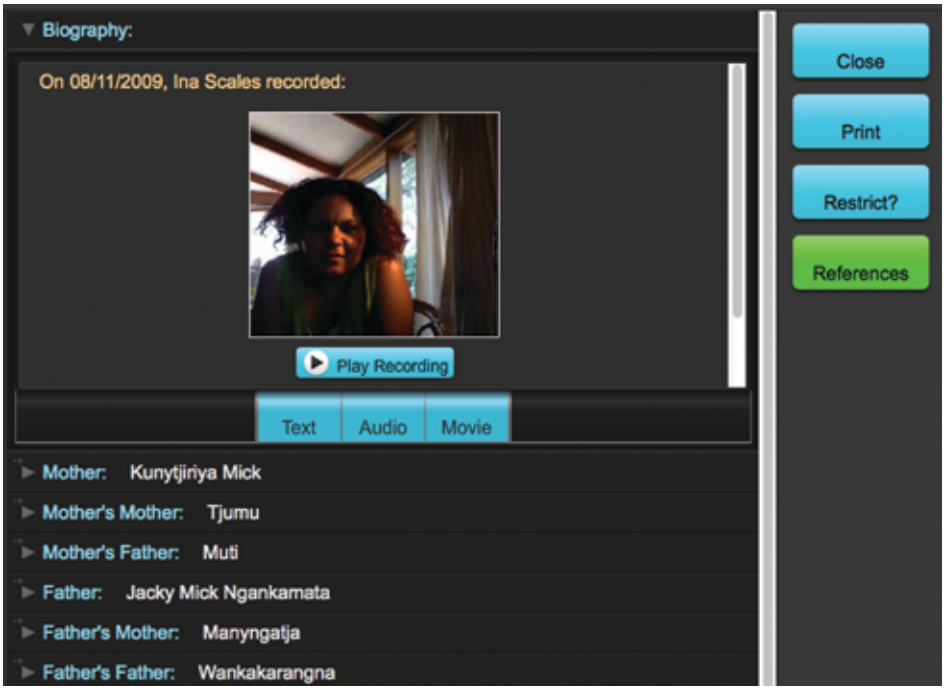

Figure 7: This detail of the profile page for Josephine Mick shows the direct video recording that Josephine's daughter made into her biography field. This can be a progressive process and further recordings can be added by other members of the family and by Josephine herself (image courtesy of Ara Irititja Project)

Following our many years of experience and feedback from the original Ara Irititja database, we have integrated the following technical features into the new software:

- the program is now a user account-based system providing:
  - improved tracking and attribution of information sources
  - allocation of functionality and restrictions at an account level
  - personalisation of the user interface screens through the user's preferences
- improved restrictions model allowing:
  - restrictions on content items, fields and profiles
  - the creation of custom restrictions
- support for common data formats for importing and exporting data to and from the database. This is important for people who already have databases and/or have been collecting data in Excel etc.

The new software is supplied on disk with detailed installation instructions. Some experience with software installation and file structure is advisable. For network set-up, an experienced network administrator is needed.

Finding security and future sustainability

The successes of Ara Irititja have been achieved through the dedicated efforts of a hard-working team of people. It has survived and even expanded despite extremely limited funding with modest recurrent grants from Anangu organisations, sales of Ara Irititja software and expertise, and unpredictable grants from Commonwealth and state government departments. In this way, Ara Irititja has maintained its independence and focus on community, rather than on institutional or public needs. In 2010 the South Australian Department of the Premier and Cabinet, through the South Australian Museum, confirmed that its annual contribution, which began in 2008, will become recurrent. This is a significant development as it will substantially reduce the time and resource-heavy burden of seeking funding sources and completing extensive grant applications. However, the Project requires a much greater level of funding to be able to fulfil its brief from Anangu, support its staff including Anangu teams, and maintain its impetus into the future: '*Ara Irititja malatja malatja tjutaku* — We want our Ara Irititja for all the generations of the future' (Imuna Fraser, NPY Women's Council Director, Yunyarinyi, South Australia, 23 March 2006).

Since 1994, Ara Irititja has fulfilled its original brief from Anangu about protecting their archival past, accessing it in the present and securing it for future generations. The Project is ongoing and growing. Ara Irititja will continue to preserve Anangu heritage and is committed to assisting other Indigenous groups with similar goals for knowledge management and community archiving through digital technology.

> I have been looking after the Ara Irititja Computer at Imanpa Community. My community would like Ara Irititja to keep supporting our computer here at Imanpa. We like Ara Irititja because it has so much information from the past, different plants and animals which school children like to look at. The archive also has many photos of people who have passed on and of many people that are still around. The kids like looking at photos of them when they were a bit smaller and of how their parents looked as well. They not only use it for fun but also for learning and understanding their culture and of how old people lived. People also use the computer to look up their friends and family at other communities as well. The Ara Irititja computer is used by many and it also gives people knowledge as well (Tanya Luckey, Imanpa Community, Northern Territory, 16 March 2011).

Notes

1. At the AIATSIS 2009 National Indigenous Studies Conference 'Perspectives on Urban Life: Connections and reconnections', Josephine Mick, a senior Pitjantjatjara woman, and her daughter, Sally Anga Scales, delivered a lively interactive demonstration of

the Ara Irititja software. They focused on how Ananangu use Ara Irititja to connect to land, family and culture within an atmosphere of teaching, learning and entertainment. Julia Burke assisted their presentation, and Douglas Mann explained the capabilities of the revised software. In 2010 the Ara Irititja team was invited again by AIATSIS to make presentations at the Information Technologies and Indigenous Communities Symposium. Sally Anga Scales presented the keynote address and the Ara Irititja team later demonstrated the new knowledge management software. On this occasion the team included John and Dora Dallwitz, Douglas Mann and Sabra Thorner. This chapter represents the amalgamation of all three of those presentations, with additional contributions and editing by Dr Susan Lowish from late 2010.

2. Central Australian Aboriginal Media Association, National Indigenous Television and the Special Broadcasting Service.
3. For example, a community member will advise the Project to research the whereabouts of a particular person who had worked in a community and is known to have taken film footage; a suggestion will be provided to change a command function of on-screen text that is not clear to people for whom English is a second language; or following a period of mourning the Project will be advised to redisplay media of a deceased person.
4. The exhibition was titled *10 Year Nguru Kulintja Pitjantjatjara Land Rights Act: Iriti nguru, kuwari kutu munu ngulaku* (10 Years Celebration of the Pitjantjatjara Land Rights Act: Then, now and always). It was later displayed at Speaker's Corner at Old Parliament House Museum, North Terrace, Adelaide, in March 1992. It is now on permanent display at Umuwa.
5. For instance, it may require expert one-hand typing techniques such as the entry of capital letters with the use of the left hand only and the temporary use of 'caps lock', so that the mouse is not relinquished from the controlling operator's right hand.
6. Anyone who enters the database can 'flag' a photo for restriction. Anangu sometimes do this or sometimes direct us to do it. In the entire history of Ara Irititja, no one has ever abused this.

Chapter 10

A digital community project for the recuperation, activation and emergence of Victorian Koorie knowledge, culture and identity

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Abstract: *In 2003 I participated in the production of a digital community project for Victorian Koorie communities. The team of Indigenous and non-Indigenous people, who contributed their wide-ranging expertise to the Koorie Heritage Archive (KHA) project, are past and present members of dedicated units at the Koorie Heritage Trust based in Melbourne, Victoria, including the Koorie Family History Service, the Oral History Unit and the Collections Unit. The project's intention was to bring together cultural heritage materials that are significant to Koorie people and currently dispersed throughout state record-holding institutions, private collections and local Indigenous community organisations; to record personal and community histories; and to document family and placenames, which are all important for recuperating and preserving Koorie knowledge, memory and identity. This chapter traces the development of the KHA as a pilot project, and looks at some of the key issues of creating and implementing this specific digital knowledge system, which lays new ground for appreciating and, if necessary, evaluating such projects.*

This chapter examines how a photograph, held within the media-rich KHA library, can offer a point of orientation to follow a dynamic human mapping of hidden pasts or misplaced histories that transpire from the interplay between memories and cultural artefacts. Through the personal, social and political stories told by Koorie people, I hope to capture the non-textual and often abstract nature of how Koorie individuals and their families navigate their way through the contested arena of Indigenous and non-Indigenous knowledge systems. The lively and transformative

performance enacted with truth, conviction, tears and laughter, and firmly grounded in the activities of local community life, presents a timely place to consider how the past is reinscribed and reincorporated into a present-day reality. The following is therefore a reflective piece drawing on an 11-year history of working with Victorian Koorie people and a background in performance and visual arts, which emphasises the stories and places at the centre of culture and identity.

A community-centred organisation for Koories

The Koorie Heritage Trust (the Trust) is a dedicated Indigenous cultural centre with museum status that was established in 1985 by Jim Berg, a Gunditjmara man from Framlingham Mission in the Western district of Victoria, alongside the late Ron Castan AM QC and Ron Merkel QC. For more than 25 years, the Trust has focused on building pride and strength in Victorian Koorie communities. The organisation actively supports emerging Koorie artists and promotes the unique artwork of this region. An integral part of the Trust's philosophy is to assist Koorie people in reconnecting with family, culture and identity. A family history service supports members of the Stolen Generations to trace their families and communities through personal records and state archives, and the Oral History Unit (OHU) actively records the stories of elders and community members. The Trust's collections of photographs, family trees, artefacts, artworks, oral histories and manuscripts are important resources for Koorie communities to maintain cultural heritage for present and future generations. The Trust reflects the ever-changing culture of Koorie people, and provides a strong message of a culture continuously re-interpreting and incorporating past traditions into a contemporary landscape.

In 2001 I sat at a table across from Jim Berg, the Chief Executive Officer and founder of the Trust. I was at the Trust, then situated on Flinders Lane in Melbourne, for an interview. The position was within a new unit known as the Koorie Family History Service (KFHS), which had been funded by Aboriginal Affairs Victoria to assist Stolen Generations and Koories in custody to reconnect with family, community and culture. This service came out of the recommendations of the 1997 *Bringing Them Home* report (HREOC 1997) following the National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from Their Families, which drew upon 535 oral and written testimonies from Australian Indigenous people who had suffered under removal policies.

Sitting at the table, I felt slightly intimidated. Well, very intimidated. I was in the presence of a Koorie elder, who demanded my utmost respect and would repeat questions until my answers suited some kind of knowing to which I was not privy. Reflecting on this experience in recent times, I remember a strong feeling of discomfort and unease. I was adrift in the rhythm and language of a knowledge system separate from my own, and was unsure how to act within this space. At the time, I was in the

final stages of an undergraduate arts degree exploring a subjective view of the world through a camera lens, and reconciling an urban reality and cosmopolitan lifestyle with a distant landscape of childhood memories. I was the daughter of a pastoralist and tied to a place marked by the undulations of the Great Dividing Range — a place inflected with an ancient geological history comprising salt lakes, hinterland desert and golden sheets of settler wheat fields. The Wimmera was my central point of reference for understanding and relating to the world. I knew little about the Trust, Jim Berg or the Victorian Koorie community.

Over the past ten years my involvement with the Koorie community has taken me to the sites of former and existing missions and reserves, family homes, correctional facilities, state government ministerial offices and record-holding institutions. It has required long stretches of country driving, cups of tea intermingled with revelatory remarks about lived experience, and much patience and diligent listening. I have been privileged to hear and share many stories on country with Koorie elders and community members, in many instances recording and filming narratives that often bare the wounds of being displaced from family, culture and community, and searching archives for family history information that has never before been seen by those discussed in the records and, when found, notably lacks compassionate sentiment. The continuous motion of this learning from encounters with other perspectives and ways of knowing has presented possibilities to witness a Koorie experience of cultivating and making visible those lost values and meanings absorbed in the past by a monological Western culture.

In 2009 I again sat with Jim Berg, this time to talk about a doctoral research project to collaborate with Koorie descendants on Indigenous perspectives about historical photographs. The KHA catalogue included a large portion of Jim's collection exhibited as part of *Have Camera Will Travel*, an exhibition depicting more than 825 portraits of Koories photographed in an intimate fashion and presenting intersecting community narratives about survival, family relations and lived experiences grounded in history, culture and places of significance. The portraits present a contrast to past anthropological photographic and film surveys of Australian Indigenous people that had been governed by a desire to document a 'dying race'. The difference, Jim explained to me as we looked at the portraits, is 'each and every one of these portraits, they are smiling and have got a grin on their face. These are natural expressions, not forced.'[1]

Surrounded by a sea of Koorie faces, I witnessed how photographs express links to family and community. The conversation with Jim was punctuated by detailed social histories of individuals, beginning with the announcement of their names, where they came from, and the families they were connected to — their relations. It was a space where converging histories drew lines of cultural genealogies as they were reconstructed through specific narratives about relationship and community. I considered why this was so important for Koorie people, asking, 'Why do you think that's so strong in the Koorie community, that sense of needing to know who you are and where you come

from? How is it any different to non-Indigenous people?' The questions were answered without hesitation and with strong conviction:

> The policy in the old days said you will lose your identity. You will lose your culture and spirituality and everything else. So we had in the old days no choice, otherwise we were penalised. In the broader community people had a choice of losing their language, their culture or their identity if they wanted to.
>
> We had no choice. So to bring back the dignity and spirituality, we have to find ourselves within ourselves, so we've got to go back and bring our culture forward, and that's important and then we know who we are. And broader community sometimes don't quite understand, because they've never been in a situation where they were told — Hey you don't exist. But we do exist and we need to reclaim or recapture or just bring the past to the present, and that is knowing who we are.[2]

I have drawn upon this conversation with Jim Berg about his photograph collection in the KHA for several reasons: first, to weave a Koorie voice instrumental to my learning as a non-Indigenous researcher into this narrative about a digital community project and, second, to map the terrain of culturally mediated images from a Koorie perspective. Though it draws attention to one primary form of cultural artefact, the photograph, the sentiments expressed in the following accounts of the KHA and community interaction with this project could also apply to digital video, film, artworks and manuscripts.

A digital community project

The KHA has been designed as a media-rich library of digital photographs, audio, movies and historical colonial manuscripts. It is based on the Ara Irititja model established in 1994 for the Pitjantjatjara and Yankunytjatjara (Anangu) peoples. The graphic interface and user experience reflect the needs of archivists and researchers, but also support cultural icons and cultural protocols appropriate for Koorie individuals and families. The KHA empowers Koorie people to tell their own stories about family, community and country through the experience of engaging with photographs of significant people and events, images of cultural artefacts and objects, artworks, and digital video and film footage, and by hearing elders and other community members telling personal and community stories.

The KHA supports the role of the KFHS to address issues about identity, the breakdown of Koorie families and communities, past injustices, connection to culture and access to cultural heritage materials that have been shelved away in state record-holding institutions. In the words of Kooramyee Cooper (in Huebner and Cooper 2007:20), a young Indigenous woman working as a caseworker and genealogist in

the KFHS in 2003, who was responsible for taking the KHA out into the Koorie community, this pilot project was an invaluable tool for her people:

> The KHA allows individuals to see and hear why they were taken off the land, why this land was taken from them and why they were put on missions. It plays a fundamental part in working out who we are. It helps to rebuild oral histories, kinship laws, cultural handing down of past laws, dances, and languages. It allows Koorie people and community in Victoria, to preserve who they are, in their own way.

The KHA does not exclude non-Indigenous information, but incorporates these narratives in an attempt to bridge the gap between Indigenous and non-Indigenous knowledge systems and to acknowledge the complexities of our entangled histories. Accessing, viewing and hearing, and interacting with, identifying and naming culturally significant objects strongly supports the journey for many Koorie people in (re)connecting with families and community, and rebuilding intergenerational relationships.

> The KHA allows for the Koorie community to be transported from the past to the modern world, by bringing life to old customs by using modern technology. In a world that has modern technology at its fingertips, each generation of Koorie people are losing the value of Koorie customs and are being assimilated in a world that has no time to stop and hear the voices of the past. Changes in Victoria have seen Koorie people, community and culture destroyed, however the KHA has allowed the Koorie community the chance to preserve and protect customs, and way of life with modern technology. (Kooramyee Cooper in Huebner and Cooper 2007:25)

The ability to meld Koorie culture and technology undoubtedly relies heavily on a relationship of trust with Koorie community members, which comes from a willingness to listen and hear the voices of Koorie people. Community consultation was a large part of establishing this pilot project and was a means to experience the living nature of this archive.

> It empowers Koorie people; it encourages them to record; to take ownership of who they are; and what place they play in our community. Young or old, everyone plays a part and the KHA allows that. It allows the modern world to bring the past forward and allows Koorie Elders to sit down and share the past with the future generations…Technology alone can never explain why someone was taken; or explain why Indigenous kids hate the system…It's only the voice given to the stories from the past, that can release a shield. (Kooramyee Cooper in Huebner and Cooper 2007:23)

The relationships developed with record-holding institutions by the KFHS to access personal and family records for Stolen Generations people were utilised to obtain digital copies of archival material for the KHA. The KHA was able to retrieve digitised versions of historic photographs and manuscripts from collections held by the State Library of Victoria, National Archives of Australia and the Public Record Office Victoria. It was very clear during on-country visits to Koorie communities that Koorie individuals preferred to hear stories and view cultural material within their own homes and as part of a digital community project, rather than by visiting a state record-holding institution.

Cultural identity and pride in one's own culture and history is important for cultural continuity, and it is also a basic human right. However, it is a right denied to many Australian Indigenous people through the dominance of the narratives created *about* them. Throughout our nation's history, Indigenous voices have been silenced and suppressed, and this has had a profound and continuing impact on Koories.

> Koorie people, even though a lot of the mob don't say it out loud, have a fear of government organisations. That stigma. Children are still being removed today and children who were removed are still coming home and will be coming home for the rest of our lives. The government organisations are scary and they're not culturally appropriate. (Kooramyee Cooper in Huebner and Cooper 2007:27)

The KHA was launched on 14 November 2003 at the Trust and attracted a large crowd from both the Victorian Koorie community and the wider community represented by state record-holding agencies, Indigenous-focused services and various government departments. At the time of the KHA launch, the Minister for Aboriginal Affairs was the Hon. Gavin Jennings, MLC. He attended the event and witnessed, along with everyone present, a synthesis of digital technology and Koorie culture through the experience of a Koorie mother sharing personal and family history about her life as a mother, aunt and grandmother with a son she had not seen for more than 30 years. In this moment of reconnection with materials of cultural significance, the power of the KHA was evident.

In a letter of congratulations dated 5 December 2003 and addressed to members of the state parliament, Jennings wrote, 'The Koorie Heritage Archive will bring immeasurable benefits to Koorie people who are now able to access previously inaccessible information on the database to learn about their lost culture and ancestry and to be proud of their unique tradition and identity as the Indigenous people of this country.'

In a parliamentary speech later that week, Jennings informed members of the Victorian Parliament about the digital community project, saying that Koorie people now had access to a 'very powerful information system' with the potential to enable

individuals to trace family connections in the 'context of the history and culture of their country' (Parliament of Victoria 2003:1335). Further:

> It is a very powerful piece of information software and a tool that members of the Aboriginal community can use to empower themselves to become better informed and, critically, to make important connections with their lost families.
>
> As many members of the chamber know, the stolen generation phenomenon and Aboriginal communities losing connection with family is a profound issue that will be greatly assisted by this information database. I was happy to be joined at the launch by Margaret and her long lost son, Mathew. Margaret lost contact with her son soon after he was born in Warragul thirty years ago, and through the information on this system, through the Koorie Family History Service they were able to piece together this connection and find one another…
>
> Every single person who was at the launch on Friday wept with joy at seeing how this important software could be used in a profound way to improve the quality of life for Margaret and her son. This database will not be an abstract archive sitting on the shelves getting dusty but will be used to improve the quality of life and the connections of Aboriginal communities and individual members of those communities. (Parliament of Victoria 2003:1335)

For Koorie people, personal histories are tied up with larger community histories, and lie within Dreaming stories that connect people to country and country to people. An Indigenous landscape interconnecting the past and the present is their archive. There are two archives at play within the KHA. One is a literary and visual production of history, where the coloniser and Australian Indigenous experiences are wound in and around each other, and the second is a continuous lineage of unwritten traditions based on genealogies and oral recollections of ancient stories.

What is interesting with the KHA is discovering what these points of connection look like for Koorie people, and the ways they potentially support a process of recuperation for a past that is more often than not held within a Western archive and subsequently positioned outside of a Koorie place of meaning and understanding. The KHA, during its pilot stage, was predominantly experienced in the spaces of people's homes as a one-off experience. It has never existed as a permanent fixture in a regional Koorie community co-operative, learning centre or health service. This is primarily due to a lack of funding and redirection of the Trust's focus both politically and financially at the time. However, the intimacy of visiting individuals on country, and in surroundings familiar and part of everyday living, provided a unique insight to an experiential condition of ascribing new meanings central to identity construction.

Koories responding to a digital community project

During the development of the KHA project, I came across a private collection of photographs belonging to Vera Bennett, nee Hanlon, a local non-Indigenous woman, who had been a teacher at the Lake Tyers mission in East Gippsland, Victoria, in her mid-twenties. Bennett taught at the mission school between 1949 and 1950, and, looking through her collection, fondly recalled her experience of teaching the young Koorie children.

Bennett is now in her eighties and during my visit to see her in 2009 she constantly reminded me that I was 30 years too late to obtain social history details pertinent to the images. Her memories, she told me, were fading and she was on her way out. I knew her sentiments were true in many ways, but I humoured her at the time, nonetheless, with a reassuring laugh based in the knowledge that she was suffering from an ear infection causing temporary partial deafness and a great deal of sensitivity about her wellbeing.

It was becoming difficult for her to remember the names of the youthful and bright faces gazing back at us. The names and family connections she once knew well were becoming elusive and, more and more, the children represented a lived experience eroded by time and replaced instead with a sense of unfamiliarity. They were now strangers that not even mental straining or groans of frustration could bring to life, and I witnessed her grapple with the prevailing emptiness that comes with an inability to recall every detail of the experiences woven into the fabric of our lifetimes. Every now and then there would be a rewarding recollection, and a small anecdotal story told. But more often than not the past was a haze of intermingled memories and ghostlike figures. I am grateful for her generosity and trust in me. The photographs are her personal treasures, and I noted how they were carefully kept in individual envelopes, neatly labelled in her cursive handwriting and ordered according to some sort of systematic categorisation that made sense to her.

These photographs of the Lake Tyers children now sit within the KHA. This private collection stands outside the familiar representations of Australian Indigenous people often portrayed by anthropologists. Though I believe some of the images were, at the time, taken for the Victorian Education Department to relay back to government, the progress of mission schools and the recording of the everyday movements of Koorie people were no different from the history of constant reporting by missionaries to the Board of Protection in Melbourne.

This particular collection possesses an intimacy emerging from advancements in the camera's ability to capture an event with a faster shutter speed and a deviation away from the very formalised studio portrait, and it seems to convey a sense of place still resonant with the memories of the people it depicts. Though the stories may not live in Vera Bennett, the photographer and teacher at the mission, it is possible to locate a present-day meaning in the recollections of the Gunai–Kurnai elders who are pictured in these images, or through their surviving children or nieces and nephews, who may have inherited their stories about growing up on the mission.

In 2003 I travelled from Melbourne to the Lake Tyers mission, also known as Bung Yarnda, to visit Koorie elder Aunty Ivy Marks at her home. The following recollection is a personal response written about the community consultation undertaken as part of the KHA project, and the Mission Voices website that was also being developed at that time. It was the first time we had travelled to community with the project and it captures the evocative nature of photographs to inspire a mediated experience of place that moves between the past and the present and captures the tension between cultural objects and the person viewing them.

> A raucous laugh erupts and permeates the entire house. Animated finger in mid-air followed by a firm shove into the somewhat delicate surface of a laptop screen an Indigenous Elder, grandmother, mother and aunty, locates herself as a young girl in a photograph taken at Lake Tyers Mission in East Gippsland in 1949. Victorian Koorie Elder, Aunty Ivy Marks, summons her family with a strong and commanding voice. It's a notable contrast to her small [stature], but it works. Her children, nieces, nephews and grandchildren surreptitiously appear from places within earshot but not in sight and gather around her at the kitchen table. They spend hours scrolling through the photographs held in a digital community project and listen respectfully to her as she shares the stories of her family, her mob and her lived experiences growing up on missions in Victoria.[3]

Figure 1: Koorie elder Aunty Ivy Marks (back row, third from left). Photographer: Vera Bennett, private collection, Lake Tyers mission, Victoria, 1949/1950. Digital reproduction: Koorie Heritage Archive at the Koorie Heritage Trust Inc.

In Figure 1 Aunty Ivy is at the back of a group of school children. It is difficult to see her face clearly, and her attention is directed beyond the frame she has been captured within. The act of recognising herself and the activation of ensuing stories brings alive a lineage of knowing that is not governed by a Western notion of time. Within seconds of seeing the photograph displayed above within a slideshow in the KHA, Aunty Ivy identified herself and, also, some of the other children standing together in the long dry grass outside the building of their mission school. With the help of her grandchildren, she manoeuvres a computer mouse around the screen and points out the familiar faces of her community. She activates a desire in her family to remember who they are and where they come from.

Aunty Ivy locates herself in the past, and, in doing so, recalls a series of experiences that enables her to generate a narrative arising in the impertinently intimate space of household domesticity. She conveys a history in her own voice and in her own time, which powerfully produces a sense of ownership and authenticity that is non-violent in nature. Her words express a knowledge firmly rooted in a place of meaning, and not completely destroyed by the perpetrating acts of a monolithic narrative tightly wound in and between her present-day experience of the world and her reality on Lake Tyers mission, her home.

The photograph in this place and time represents more than a remnant from the past, and I present this experience with Aunty Ivy as a way to talk about the richness of witnessing what it means for past representations of Koorie people created by anthropologists, or the like, to be dismantled by stories about family, community and culture. Aunty Ivy not only claims her own history. She also turns the colonial artefact back into something that is useful again. The photograph is situated within a personal history that diminishes the terrifying nature of colonial objects. In the past these objects have had the tendency to portray an uncontested truth; a historical colonial narrative harboured in the security of its creators or the systematic legacies they have left behind.

In a recording for the Mission Voices website, now part of the oral history collection at the Trust, Aunty Ivy describes what school was like on Lake Tyers mission (Mission Voices 2003:2):

> Well, when we went to school on Lake Tyers there was about three or four hundred children at the school and there was only two teachers, yes, and that was a school down the bottom, just down from the park, this straight opposite the church, and we used to go to church there, we used to go to Sunday school. Weren't allowed to wag Sunday School, that was right out of it. We had to go to church whether we like it or not, but we had to go. That's what I say, children now, they don't even think about going to church and when we used to go to church there used to be plenty in church, plenty of children there, plenty of people and they'd all sing, you know, everybody, and the school life, it was good. Yes, I went to school with a lot,

> my brother-in-laws, my one brother-in-law, he's passed away now, I went to school with him and, you know, it was really good but we were more or less like all friends together, just like one big family and that was the way it was in them days. Now, it's not what you call a mission now, it's really not, and I don't care what anybody says, it is really and truly not like a mission now, not like back in them days. It was really good.[4]

For Aunty Ivy, the threads of past experiences are inextricably woven into her everyday life, and her stories about the photograph picturing her as a young girl standing outside a mission school building help to generate a counter-narrative to the one held in record-holding institutions or the literature of non-Indigenous historians.

Aunty Ivy has since passed away. It was a privilege and an honour to spend time with this incredibly strong and vocal woman, and to witness the revelatory experience of her peeling back the layers of her personal history, as activated by a photograph held in the KHA, and bringing forth from the silences and shadows of a photograph a uniquely personal and culturally specific experience.

'Photographs', Jim Berg told me, allow his community to journey forward, 'to reach back and see what you can find and bring it forward into the present and the future'.[5] They are more than a material object for reflection or a keepsake:

> There's a lot of history behind each photo, each portrait, each individual. There's a story to tell. What's happened since that photo was taken? Where are they now? The journey behind each image…people should remember where they come from, who they are and what they are. You can't be something that you're not.[6]

Where to now?

Developing a digital community project for Victorian Koorie communities provided the Trust with many challenges. It required extensive resources to meet the technological and administrative demands of a 'closed' archiving system, and an ongoing commitment to carry out widespread community consultation to respectfully represent the cultural protocols of Koorie individuals and communities. This was a lot to ask of an Indigenous community organisation heavily reliant on state government and philanthropic support and already at its capacity to preserve Koorie culture in multidisciplinary ways.

It is not an easy task to evaluate the success of the KHA. The project currently resides in the library at the Trust, but has not been developed beyond the pilot stage. Further funding is required to adequately meet the ongoing needs of such a project, which include software upgrades, digitisation, community consultation and access. This raises questions about the long-term sustainability and longevity of community-centred

projects and the plethora of choices now available for the recuperation of Indigenous knowledges. It has not been my intention to present the KHA as the most preferential model for preserving and returning materials of cultural significance to the Koorie community. It was a tool chosen on its merits and a demonstrated history of on-country use by other Australian Indigenous communities.

Victorian Koories speak about contested histories and reveal non-textual experiences of what it means to trace and reconstruct family history through photographs, historical colonial narratives and other cultural objects that are sites of cultural activation. The tension between a digital replication of culture and the spaces of everyday Koorie life is a provocative mediation of memories, everyday experience, and the connectivity of both Indigenous and non-Indigenous histories. The digital community project takes its place on the periphery and holds space for a central performance evoked by seeing and hearing evidence of family, community and country.

The emergence of Koorie voices does not take place in a Western temporality, but within an experience of time governed by their own everyday lives and those of their ancestors. It is shaped by a particular knowledge concerned with heterogeneous experiences that are wound in and around a colonial past and made meaningful through stories about growing up on a mission, the birth of children, family gatherings, funerals, weddings and, for many, the painful dislocation from family, land and community. The living Koorie community presents different and competing personal histories that are important for the emergence and re-inscription of the past in the present. As mentioned earlier, they are not based within a hegemonic notion of time inflicted upon Koorie people with unforgiving force by government authorities and complicit missionaries, but lie rooted deeply in the rhythms of family, culture and identity.

The intention of this chapter has been to share some of the simple, yet profound, experiences I have had when Koorie individuals and communities are given the opportunity to revision the past and explore personal and community histories through the window of such objects as photographs. In this moment of reconnection with the past, emerging personal and community histories and their unique and powerful expressions are placed firmly in the spaces of everyday Koorie life. The laughter of Aunty Ivy, as her finger connects with a digital image of herself while sitting at her kitchen table, is an experience woven into the fabric of her own cultural and social life: a Koorie sense of belonging and connection to family and community. As Jim Berg clearly stated in our conversation, 'Well they [the photographs] do have a voice if the individuals who're looking at them know who they are.'[7]

Acknowledgments

I acknowledge past and present Victorian Koorie elders and community members who have contributed their wisdom, stories and cultural knowledge to the Koorie Heritage

Archive project. I am indebted to the late Aunty Ivy Marks for sharing with me her stories in such an honest and courageous manner and for gifting me the experience of witnessing her journey of *knowing who you are and where you come from* in the simple but potent space of her kitchen at home on Lake Tyers mission. I am grateful to the family of Aunty Ivy for their continued support and commitment to keeping her spirit alive. I would also like to thank Vera Bennett for making available a personal collection of photographs and for sharing how a non-Indigenous woman came to photograph Koorie youth. For the experience of working within a dedicated Koorie community organisation, I will always be deeply grateful to Jim Berg and the Koorie Heritage Trust *family* — that is, past and present staff.

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Notes

1. A recording by the author with Jim Berg at the Koorie Heritage Trust Inc., 2009.
2. A recording by the author with Jim Berg at the Koorie Heritage Trust Inc., 2009.
3. Author's personal reflections recorded in an on-country journal after a visit to Lake Tyers in 2003.
4. Interview recorded by the KFHS with Aunty Ivy Marks for the Koorie Heritage Trust Inc. and Australian Broadcasting Corporation (ABC) Mission Voices Website.
5. Recording by the author with Jim Berg at the Koorie Heritage Trust Inc., 2009.
6. Recording by the author with Jim Berg at the Koorie Heritage Trust Inc., 2009.
7. Recording by the author with Jim Berg at the Koorie Heritage Trust Inc., 2009.

Chapter 11

Digital archives and discoverability: Innovating access to the Strehlow collection

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Abstract: *The Strehlow collection is one of Australia's unique cultural treasures and represents a fundamentally interconnected set of archival data collected between the early 1900s and 1970s relating to the ceremony, land tenure and genealogical connectivity of Central Australian Aboriginal people. The research of Carl and TGH Strehlow resulted in one of the world's largest and best-documented collections of material relating to Indigenous ceremonial life, and is a rich and complex source of anthropological data and cultural and family history information. Through database development and digitisation programs, the Strehlow Research Centre aims to promote increased access to, engagement with and participation in the management of the Strehlow collection by Aboriginal custodians.*

This chapter provides some background to the Strehlow archive and considers the historical context that has informed current approaches to the repatriation of Indigenous cultural property by museums and other collecting institutions more broadly. The latter part of the chapter examines Aboriginal engagement with cultural archival records and the repatriation of ceremonial objects from the Strehlow collection. This chapter also discusses the challenges of accessing and navigating the Strehlow material in an attempt to initiate digital repatriation while opening appropriate access to the Strehlow collection to researchers and the general public. It provides a work-in-progress account of several projects that have been subject to the complex, evolving worlds of convergent media, digital heritage preservation and intercultural communications.

Introduction

The proliferation in recent years of convergent media, interrelated databases and federated search functions has provided new and innovative ways for archival institutions such as the Strehlow Research Centre (SRC) to provide Aboriginal communities and custodians with access to cultural heritage records and the Indigenous knowledge housed in our collections. The concept of Indigenous knowledge has gained powerful currency since the 1980s, particularly in the areas of ecology, botany, agricultural economics and wildlife management (Agrawal 1995:415). Commentators such as Agrawal (1995) and Nakata (2003), while critiquing the appropriation of Indigenous epistemes by scientists, have also demonstrated that access by Aboriginal people to the Indigenous knowledge housed in archives and other institutions can augment traditional forms of knowledge transmission.

The Indigenous knowledge housed in the SRC archive is a significant resource for Central Australian Aboriginal people. However, due to cultural restrictions placed on access to ceremonial records and the absence of in-built discoverability in the current collection management system, access to the collection is predominantly mediated through SRC staff. It is through direct connection with the living culture it documents that Indigenous knowledge as data is revitalised. Through the implementation of database development and digitisation programs, the SRC aims to promote increased access, engagement and participation in the management of the collection by Aboriginal custodians.

This chapter begins by providing some background to the Strehlow archives and current access to the collection, and examines the reasons why cultural heritage records are more frequently accessed than the ceremonial objects housed in the Strehlow collection. It also positions the collection, and the SRC's ceremonial object and digital repatriation programs, within the broader historical contextual framework of repatriation as a vehicle of cultural continuity, and discusses the SRC's current database development projects. The latter part of the chapter explores the development of this database in greater detail.

An overview of the collectors and the collection

The Strehlow collection was assembled through the collective work of two men: Carl Strehlow, who served as the Lutheran pastor at Hermannsburg Mission from 1886 to 1924, and his son, Professor TGH Strehlow, whose fieldwork and research from 1932 until his death in 1978 provided the major elements of the Strehlow collection housed at the SRC in Alice Springs. The great strength of the Strehlow collection, and what makes it unique in the body of Australian anthropology, is the interconnected nature of its data and its focus on mapping the ancestral Dreaming landscape of Central Australia (see Jones 2010:3). Although TGH Strehlow's research focused on the

Arrernte specifically, the Luritja, Pintupi, Warlpiri, Alyawarre and Anmatyerr language groups are also represented within the collection.

TGH Strehlow's ambitious project, which developed from the early days of his anthropological field research, was to provide as complete a record as possible of Arrernte social organisation and ceremonial traditions associated with Dreaming ancestors. This project had its genesis in Strehlow's initial field trip to Central Australia in 1932, under the auspices of the Australian National Research Council and the Board for Anthropological Research in Adelaide, with directions to undertake a comprehensive survey of four main Arrernte dialects (FitzHerbert to Strehlow 1932). It was during this initial fieldwork period that Strehlow commenced documenting and recording Arrernte ceremonies in film and images, and began collecting and assembling the meticulously documented collection of the Arrernte men's ceremonial objects known as *tywerrenge*, which the media would later call the 'crown jewels of Aboriginal Australia' (*Advertiser*, 10 November 1984:1).

The Strehlows' legacy is an exceptional collection of Aboriginal ceremonial objects, documents and recorded items that includes information relating to cultural and ceremonial traditions, traditional ecological knowledge, family relationships and socio-historical events. The collection is a remarkable, multi-layered record dating from the Central Australian early contact period through to the 1970s.

Questions of access

The Strehlow collection has an immediate connection to the contemporary Central Australian Aboriginal community. Aboriginal people are the main users of the Strehlow archival collections, and the interests and concerns of Aboriginal custodians are central in determining how the Strehlow collection is accessed and managed.

Sacred objects and records of ceremonial material constitute a large proportion of the overall collection and these are regularly accessed by Aboriginal custodians. This material is highly significant to Central Australian Aboriginal communities, and due to strict cultural protocols regarding access to ceremonial archival material, the SRC has developed a consultative model through the development of networks within Aboriginal communities to provide advice and guidance, and to ensure that these protocols are observed in the management of and access to the collection.

The SRC aims, where possible, to return ceremonial objects and associated archival records held in the collection to Aboriginal custodians. Access to ceremonial archival records is more frequently requested than access to or the return of sacred objects from the collection. The return of sacred objects can present logistical and ritual challenges to Aboriginal custodians because archival materials are often densely encoded. For example, cultural information contained in records, such as ceremonial film and audio recordings, exemplifies these types of records and their capacity to support the continuity of cultural practices. This is particularly so in circumstances

where cultural knowledge has been lost or where the remote location of sites makes it difficult for people to visit regularly. In these instances, the digital record can, to an extent, augment or provide an alternative to traditional forms of knowledge transmission.

While the provision of access to and the return of Indigenous knowledge records are the focus of this chapter, it is useful at this point to briefly consider the historical context that has informed current approaches to repatriation by museums and other collecting institutions.

Repatriation: a historical context

Many of the items that constitute museum collections were acquired in colonial and postcolonial circumstances under conditions of unequal power relations. However, changed political and cultural conditions in many previously colonised countries have enabled Indigenous peoples to increasingly assert control over their identities and articulate claims for the repatriation of cultural heritage materials (Simpson 2002:203). As such, Indigenous claims on museum collections are positioned within broader debates that have, at their roots, the contested politics of culture, colonialism and history.

In the colonial period, collecting was grounded in the construction of Indigenous cultures according to European notions of racial identity. As a consequence, contemporary claims to Indigenous cultural heritage material held in museum collections are often made from a position of ethical rights and responsibilities based on notions of ownership and identity. This debate is embedded within broader contexts that encompass the international politics of museums, archives and Indigenous peoples, and claims are often negotiated within a framework of disputed legal and moral rights.

Changing perceptions at an international level regarding rights to Indigenous cultural property have led to the negotiation of new social relations that acknowledge moral ownership of cultural heritage material and the empowerment of Indigenous people (Glass 2004; Pickering 2002). Ethical concerns regarding Indigenous identity and ownership of cultural heritage material emerged in the 1970s, and were the result of a combination of factors. Technological advances made the Aboriginal cultural heritage material circulating in museums and other institutions accessible to remote Aboriginal communities through the increased circulation of print media and television, and their increased participation in these technologies (see Michaels 1986). At the same time, improved access to transport and better transport infrastructure facilitated increased Aboriginal mobility and, therefore, contact with cultural heritage material circulating in the wider community. These developments occurred in parallel with the formation of Aboriginal Land Councils, which provided Aboriginal people with a vehicle for articulating their concerns. As a result, Aboriginal people were increasingly able to

articulate claims to secret sacred objects and associated cultural heritage material held in museum and archival collections.

In response, Australian museums have also undergone a gradual transformation over the past 30 years and now recognise the rights of Aboriginal people to control how their cultures are represented. All Australian state and territory museums, and most archival institutions, have now developed guidelines that facilitate repatriation, as well as protocols for the culturally appropriate storage of and access to Aboriginal cultural heritage material. In addition, the federal government, through the Return of Indigenous Cultural Property and International Repatriation programs, provides funding for the repatriation of cultural objects and ancestral remains.

However, while museums have changed their protocols to support repatriation, the return of secret sacred objects and cultural heritage material has emerged as a complex process. Issues regarding ongoing logistical support for communities, such as secure storage facilities and financial support to employ staff to care for objects, have been obstacles to repatriation (Pickering 2002:40).

In recent years, there has been an increase in the 'voice of Indigenous people representing themselves and their position' (Nakata 2003:7) through the performing arts, television, radio and the internet. Museums have also recently incorporated Indigenous perspectives into their displays and collecting protocols, as evidenced by Te Papa in New Zealand and a recent exhibition at the Macleay Museum called *Makarr-Garma: Aboriginal collections from a Yolŋu perspective*, curated by the Yolŋu elder Joseph Gumbula.

Digital management access and repatriation

The SRC has developed good relationships with Aboriginal communities and traditional owners whose Indigenous knowledge records and intellectual property constitute the Strehlow collection. This is a significant development given the controversial circumstances under which the SRC was established in 1991. At the time, Central Australian Aboriginal people were calling for the immediate return of the collection to traditional owners. However, the *Strehlow Research Centre Act 1988* (NT) did not allow for repatriation. In 2005 the Act was amended to facilitate the repatriation of secret sacred objects from the collection.

Since the Act was amended, a number of objects from the collection have been returned to traditional owners and the SRC has also assisted in the return of sacred objects from other museums. In some cases, traditional owners have elected to store returned ceremonial objects at the SRC after legal title has been transferred. In these instances, the return of related ceremonial archival records, such as films, audio and photographs, may be more preferential for Aboriginal communities than the physical return of objects. Such decisions may be made because of concerns about the lack of appropriate and secure storage facilities on country, anxiety regarding the danger

of storing spiritually potent objects in the vicinity of women and children, and the ritual management of objects in circumstances where transmission of cultural knowledge has been disrupted.

TGH Strehlow's 44 field diaries are, in a sense, the key point of access and the pathway into the Strehlow archive. These diaries record Strehlow's anthropological field research between 1932 and 1974, and connect and cross reference most of the collection, including its genealogies, ceremonial films, slides, photographs and audio recordings, and published and unpublished manuscripts. They contain detailed information pertaining to ceremonial knowledge, language, social organisation, traditional ecological knowledge and the cultural landscape. In 2009 the SRC commenced indexing the entire set of field diaries to make its archival records of culture and ceremonies more accessible to Aboriginal custodians and communities.

These indices explicate the Strehlow collection's underlying web of linkages, and facilitate the identification of the genealogical, photographic, audio, ethnographic film and ethnographic object information housed in the collection. They also enhance the SRC's capability to establish connections between the various elements of the collection, and can assist Aboriginal custodians to more easily locate cultural information in the extremely dense bilingual text.

In conjunction with the field diary indexing project, the SRC has also begun to develop genealogical and ceremonial object databases with the aim of making the major cultural elements of the collection digitally searchable via fields such as name, language group, totem, skin name, cultural site, ceremony, conception site ceremonial object, plants and animals. While access to culturally sensitive archival records will necessarily remain restricted to identified traditional owners, it is the SRC's aim to provide Aboriginal custodians and communities with greatly improved access to the archive by providing tools that enable people to directly engage with and play a central role in managing the collection.

Cultural heritage

At the core of this collaborative research is the question of whether a digital heritage resource can be conceived as a sustainable emerging 'thing-in-the-making' to reflect community, cultural and knowledge interests. The answer to this question is dependent upon community consultation and engagement. Our current project is intended as part of our ongoing strategy to develop and refine recent methods of using database, narrative and archival approaches to cultural heritage.

Our theoretical concerns in this project are grounded in two particular practical engagements. The SRC seeks to develop the coherence of its collection, first, through the technological facilities now available in our recently acquired database tools, Community Stories and Progeny, and, second, as a planned outreach engagement with the Indigenous communities in Alice Springs and Ntaria (Hermannsburg).

In the context of the Strehlow collection, we intend to focus on the relationship between the film and photographic media records, and the genealogical records and kinship diagrams. The Strehlow genealogies have long been considered the most comprehensive in the country, and it is this connection that will form the basis for developing key collective and individual Indigenous biographies as a means of linking into the Ntaria community.

The emergence of digital cultural heritage as a significant research engagement forms the basis for our project. The contemporary meeting of digitised heritage collections and Indigenous cultural knowledge creates both tensions and opportunities. In some prior examples of this encounter, Indigenous communities have initiated the facilities required to house and maintain their cultural knowledge. In some of these instances, cultural knowledge centres have been built for this purpose. Earlier work was undertaken in 2004 in concert with similar initiatives in Australia that identified themselves as online Australian Indigenous heritage projects. These included Ara Irititja on the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands, the Pacific and Regional Archive for Digital Sources in Endangered Cultures, and the Indigenous Knowledge Management System.

In our case, we are working with an already constituted collection housed at the SRC in Alice Springs with direct links to a constituent Indigenous community primarily located in Ntaria. Our research interest is in the digitisation of the Strehlow collection's media and genealogical archives, while at the same time we seek to engage the constituent Indigenous community at Ntaria. This is a unique opportunity to scrutinise the intersection of digital cultural heritage and Western archival practice. Indigenous historian Lynette Russell (2005) identifies the problem as one of the 'irreconcilable ontologies' that arise when 'extracting Indigenous Knowledge in order to juxtapose it with Western concepts'.

We can enunciate a specific set of concerns that will place this project within the field of digital cultural heritage research:

- the consideration of Indigenous cultural heritage and knowledge practices through the prism of conflicting or fluid ontologies (Christie 2004) with the aim of 'enabling different knowledges to be shared in ways that accommodate their differences/diversities…' (Srinivasan 2006)
- the emphasis on 'discoverability' as the potential of the archives of the Strehlow collection to interconnect their knowledge artefacts and to create a sustainable knowledge environment based on specific access conditions such as cultural sensitivities and protocols
- the exploration and exemplification of the concept of *collective biographies* to enhance collective cultural identities through the marrying of genealogical and media records.

This current project will build upon earlier research that produced a catalogue of the 25-hour film collection and an online database of digitised archival sources connected to TGH Strehlow's film works and biographical memoir *Journey to Horseshoe Bend* (Strehlow 1969). Both projects were developed in partnership with the SRC in Alice Springs and members of the Indigenous community in Ntaria.

Knowledge management

From the first principles enunciated in earlier research, the theory of digital cultural heritage has expanded beyond digitisation and storage of data to the wider implications of how cultural knowledge is a 'shared' construction (Clifford and Marcus 1986) for the archival institutions set up to house and care for this knowledge. This is an important theoretical frame from which our project flows and to which many theorists have addressed their particular concerns in the past (Nakata and Langton 2005). This legitimates our interest in the intersection between Indigenous knowledge systems and the contemporary initiatives such as database and digital technologies.

The interest in communications and information technology, and its transformative impact on society, has its highest profile in works by Marshall McLuhan (1964) and, before him, Siegfried Giedion (1948). The point here is that the interest in cultural uses of digitisation can be tracked back to the arguments of twentieth-century scholarship, and also forward, in a line that leads to the study of digital cultural heritage. Though this sounds linear, it is actually more a series of clusters of interests that came together in the context of an emergent 'knowledge economy' (Drucker 1969) with close associations to the 'information society'. These conceptual moves propose that the commoditisation of knowledge, in epistemological opposition to Indigenous knowledge management approaches, created an economy of the knowledge worker at the frontier of contemporary management practice and closely associated with the control of information. Our current project analyses how Indigenous knowledge management practices take a different view of their role in the context of cultural tradition and changing conditions of cultural maintenance.

Alluding to Giedion's (1948) work *Mechanization Takes Command,* Lev Manovich's *Software Takes Command* (2008:25) extends this intellectual project into the cultural uses of digitisation through which 'different media begin to be combined in endless new ways, leading to new media hybrids', or, to use Manovich's biological metaphor, new 'media species'. This important point suggests that the cultural mediations we may find in our research will be characterised by this 'hybrid' quality and may present us with a 'new media species'.

Of the many themes relating to digital cultural heritage, our interest is primarily in the relationship between community and heritage institutions involved with digitising technologies. In 'Finding a future for digital cultural heritage resources using contextual information frameworks', Gavan McCarthy (2007) argues that a long-term

solution to the management and curation of cultural heritage is needed. Termed by many in the field as *future-proofing*, the task, as McCarthy sees it, is to 'meet the needs of the present without compromising the ability of future generations to meet their own needs' (McCarthy 2007:245). This requirement is made difficult in the context of digital cultural heritage because of the rapidly changing nature of the technologies that lie at the core of the activities needed for a sustainable practice, and because Indigenous relationships to knowledge preservation and storage may present a different approach to this concern. Our research will address and seek out the innovations that will be needed to think critically about this issue.

Cultural context and sustainability

There is a prevailing trend within digital cultural heritage projects from which we can learn extensively. Too frequently, information systems built on the premise of universal access remain largely out of the hands of the intended users. The cultural environments of Indigenous people do not present in the same way as those in the mainstream West. This leads to further questions. How does digital technology change conditions of sharing? Are these technologies universal, or do they need to be modified according to cultural and political contexts and engagements? Who has access to digital knowledge, and how do traditional owners decide when and how to share it? These questions open up a range of concerns connected to culture and Indigenous knowledge management to which this project will respond.

McCarthy refers to two specific reasons for a lack of a system for long-term sustainability: media redundancy stemming from changes in the supporting medium that makes data unreadable, and epistemic failure stemming from a lack of adequate metadata to render the data meaningful (McCarthy 2007:246). McCarthy's main concern is how the *context* for digitising cultural heritage escapes both recorded observation and scrutiny. Knowledge of the range of activities of an archive, including its intra-organisational relationships, day-to-day practices and interpersonal communications, contributes to epistemic sustainability. In the particular instance of Indigenous cultural heritage, the contextualisation of knowledge is crucial in that the knowledge created by that community should contribute to community capacity building and community capital.

The outcomes of this project will range from facilitating knowledge transfer across generations to improved discoverability and use of significant archival resources. The current traditional owners of cultural knowledge, through these means, will ensure that those following in their footsteps can become the future custodians of their digital cultural heritage.

The significance of our research lies in the quality and form of digitised learning resources, and the activities it will support in remote communities, particularly in Ntaria. The project links up with a recent initiative in the Northern Territory that

has sought to increase Indigenous access to culture and knowledge through the development of the Territory's Libraries and Knowledge Centres, which have produced several knowledge and cultural centres, mostly in the Top End, but also with two located in Central Australia in the Anmatyerr community of Ti-Tree and the Arrernte community of Ltyentye Apurte (Santa Teresa).

Our current project will aim to improve 'equitable access' to information services through the development and application of a culturally appropriate database of biographical data such as photographs, kinship diagrams and family trees. Significantly, it will also actively bring past and present communities into dialogue and contact with each other by opening up a database for Indigenous access and digital storytelling engagement through the development of web-based educational tools that have the capacity to enhance historical and cultural knowledges relevant to the community.

Cultural heritage as educational resources

This project recognises the importance of integrating local linguistic/cultural, economic and technological imperatives of communities. The innovation in this awareness is that the project will explore this imperative through the potential of databases as educational resources. The SRC archive is site- and culture-specific in that it holds works that are relevant to Western Arrernte and will link individuals living in Ntaria today with the lives and cultural histories documented in Strehlow's works. In building on the collective narratives that emerge from the 'contact points' between past and present, the extensive genealogical histories preserved at the SRC are a key cultural resource for members of the community.

We see the purpose of education as a means to disseminate knowledge, but we also seek to question the *nature* of knowledge, to see it not as a ready-made thing, but as a 'thing–in-the-making' that can be analysed and studied in the contexts of its cultural, intellectual and cerebral properties. Nor do we assume that new communication technologies are simply a magical answer to this education challenge. There is significant literature on the limitations of introducing new technologies in education without an adequate support context in the form of human resources, such as teachers whose role is as significant in sustaining the learning imperative as the technology itself (Berg and Vogelaar 1998; Turkle 1997, 2003). Our project is focused on knowledge creation and access in remote Australia. It takes from Rosling, the noted Swedish researcher in global development, the idea that we must create a highly contextualised analysis of the needs and wants of Indigenous communities in Central Australia. Because of the differences within countries, these dictate that solutions will not be adequate if they are imposed externally from models developed for fundamentally different living conditions (Rosling 2006). We therefore adopt Rosling's recommendation to develop and apply appropriate and specific software solutions to data visualisation and representation of cultural heritage.

Conclusion

These are key aspects of the value of a digital heritage and knowledge resource and the intent to focus on access, skills and resources. The need for the application of the concept of 'fluid ontologies' (Christie 2004), and a respect for cultural diversity and community consultation, must inform any further development of database knowledge resources in Central Australia.

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Chapter 12

Discovering the earliest shadows: A Yolŋu-led approach to managing community access to archived cultural resources

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In February 2007 we embarked on an Australian Research Council (ARC) project led by Yolŋu elder Joseph Gumbula to explore his people's recorded history in the University of Sydney Archives. The aims of this initiative were to identify and assess some of the earliest photographic and written records of Yolŋu life in north-east Arnhem Land and to make them accessible to their source communities in Miliŋinbi (Milingimbi) and Galiwin'ku on Elcho Island. Other central aims were for us to work consultatively with these communities to determine their ongoing access requirements to the university's archived materials, and to consider how emerging digital technologies might be deployed to facilitate secure remote access at the local level. This was the first ARC project of any kind to be led by a Yolŋu Chief Investigator. It was inspired by an earlier ARC project at the Australian National University through which Louise Hamby and Lindy Allen conducted extensive consultations with Indigenous communities throughout Arnhem Land to document and return materials held in the Donald Thomson Collection at Museum Victoria that date from the 1930s (Corn and Gumbula 2007:116–18; Peterson et al. 2008).

Our own ARC project focused on materials held in the University of Sydney Archives that include many photographic negatives and prints taken at Miliŋinbi by the anthropologist WL Warner and the missionary TT Webb from 1926 onwards. First seen by Gumbula in 2005, these images had been absorbed into a much larger series of

materials within the AP Elkin Personal Archives (named after the university's Professor of Anthropology from 1933–56, yet including records dating from his department's creation in 1926). The university's previous Chair of Social Anthropology, Alfred Radcliffe-Brown, had also administrated the Australian National Research Council's Committee on Anthropological Research, which received monies from the Rockefeller Foundation to fund fieldwork in regional Australia and the Pacific, and it was under this scheme that WL Warner went to Miliŋinbi as a graduate of the University of California, Berkeley, and became the first trained anthropologist to conduct fieldwork among the Yolŋu of north-east Arnhem Land (Gray 2007).

Founded in 1924, the Methodist mission at Miliŋinbi was the only Yolŋu town in existence at the time, preceding the establishment of Yirrkala in 1935 and Galiwin'ku in 1942. Early in 1927, Warner travelled there via Darwin with cameras and a wax cylinder sound recorder, and over the following year took 384 images that are now held in both negative and print formats in the University of Sydney Archives. Only a small number of these images were ever published by Warner (1937); the rest remained hidden from public view for decades. Warner's host at Miliŋinbi was Rev. TT Webb, who had become the town's administrator in the eyes of government in 1926. Webb and his family stayed in Miliŋinbi until 1939, and he later documented his observations of local Yolŋu life in a manuscript called 'Aborigines and Adventure in Arnhem Land'. He asked Elkin to consider this document for publication in 1947, along with prints of 188 photographs that he had taken during his years at Miliŋinbi. Sadly, Webb died in 1949 before his book could be published, and so his records were also absorbed into the AP Elkin Personal Archives, where they were to be discovered by Gumbula 56 years later.

In addition to Warner's and Webb's materials, these archives also hold related photographs that were taken at Miliŋinbi and Galiwin'ku in the late 1940s by Elkin himself and by anthropologist AM McArthur. Gumbula's father, Djäwa, is a constant subject in photographs and writings by all of these collectors. He became one of the first Yolŋu leaders to share the richness of his traditional knowledge with missionaries and anthropologists, and directly inspired Gumbula's own fascination with research into early records of Yolŋu life from this period.

These early records are now of great importance to the Yolŋu, who have come to view their return home in the spirit of gifting and reciprocity found in traditional exchange ceremonies. Back in the 1920s it was impossible for Yolŋu intermediaries to know of the enormous future impacts and potentials that early recording and reproduction technologies would bring in decades to come. At that time, the Yolŋu believed that taking someone's photograph would take away his or her spirit. Gumbula therefore took the opportunity of our ARC project to restore this balance by giving something back to his community in the form of photographs that exclusively illustrate Yolŋu life in the early decades of mission settlement and add depth to Yolŋu oral histories of this era. Each image is meaningful in this regard. There are also

several long sequences of photographs that have yielded detailed information about traditional ceremonial practices that were once common in Yolŋu society.

As shown in Figure 1, north-east Arnhem Land is Yolŋu country and is imbued with Yolŋu names for Yolŋu places. Throughout this region there are many separate Yolŋu *wäŋa* (homelands), which are owned by different Yolŋu *mala* (groups) and are passed from father to child along with incumbent hereditary repertoires of sacred *yäku* (names), *manikay* (songs), *buŋgul* (dances) and *miny'tji* (designs). Everything found in nature on Yolŋu country, from animals and plants to tides and seasons, is named and described within these traditional canons of *rom* (law). This is the Yolŋu way of mapping reality, and all such hereditary properties are important and sacred to the Yolŋu. They capture the sacred beauty of all things in nature and, like the topography inscribed on country itself, they remain as eternal *mali'* (shadows) of the progenitorial *waŋarr* (ancestors) who named, shaped and populated the many Yolŋu homelands (Corn and Gumbula 2004).

The vintage images found in the AP Elkin Personal Archives are understood by the Yolŋu to be a similar kind of *mali'*, which give unprecedented insights into the lives of ancestors from a more recent past. They portray an intriguing array of people, families, homelands, ceremonies and early town endeavours in Miliŋinbi, and their

Figure 1: The locations of Yolŋu towns and homelands in Arnhem Land, Australia

return to this community fulfils a growing interest among the Yolŋu in local history. Yolŋu families display them in their homes with increasing enthusiasm and pride, and use them as resources to teach the young about lives and livelihoods of relatives who were born before the mission.

As exemplified in Figure 2, Warner's and Webb's photographs of the Makassan well and of transplanted tamarind trees at Miliŋinbi point to the centuries of trade that the Yolŋu shared with visiting Asian seafarers before the twentieth century. They also show the layout of the early mission, as well as the beginnings of the local hospital, dispensary, church, school and market gardens. They demonstrate how local people initially sowed crops by hand before horses were introduced, and how work on the mission was paid for with flour, sugar and tobacco rations. Yet they also show how local families continued to hunt and participate in traditional ceremonies alongside these new endeavours. Warner's photographs, in particular, show how funeral ceremonies were performed before missionary influence led to the introduction of semi-Christianised burial practices.

These photographs demonstrate what Miliŋinbi was like before the market gardens gave way to the local airstrip, and when every house on the island was made by local people from corrugated iron and cypress pine. They show the dedication and

Figure 2: The Makassan well and transplanted tamarind trees behind community-cultivated market gardens at Miliŋinbi (Webb, 1930s; photograph courtesy the University of Sydney Archives and published with permission from Joseph Gumbula)

hard work that went into the creation of this first Yolŋu town, and the direct agency of Yolŋu workers in the daily maintenance of its local services. Above all, they remind the Yolŋu of the immense social changes that they experienced over the past eight decades, and offer immense encouragement to those who face the challenges of meeting the changing community needs of today.

Though their subjects vary widely, all of the photographs held in the AP Elkin Personal Archives were restricted from general access upon their receipt into the University of Sydney Archives in 1982. This was due to a lack of knowledge about who and what they depicted, and, often, little more was known about any given photograph beyond its collector, approximate date and regional provenance. Elkin and McArthur's images came with limited descriptive information, while Webb's and Warner's came only with brief captions. Even so, the individuals they depicted were rarely identified.

While access to these photographs had been occasionally granted to native title researchers and source Indigenous communities, all such users were required to visit the University of Sydney Archives in person. Gumbula's initial work with the AP Elkin Personal Archives required him to search through box upon box of undocumented photographs, with the difficult task of identifying who and what they depicted. While older Yolŋu have often been able to recognise the people portrayed in images of this vintage, there now remains only one elderly woman who retains living memory of Miliŋinbi in the 1930s and the individuals depicted in Webb's and Warner's photographs.

Appropriate access management for these images stands as a crucial concern for both Yolŋu communities and the University of Sydney Archives, and great care has been taken to ensure that images of anything that is restricted from public access under Yolŋu law are not inappropriately displayed. Webb's images mostly portray general community life, yet Warner's primarily document restricted men's ceremonies. At our project's outset, Gumbula exercised his knowledge and authority as a Yolŋu elder to sort all of these images into two broad access categories, *garma* (open) and *ŋärra*' (restricted), before further refining these into narrower topical sets. Images of specific ceremonies were grouped together, folders to be addressed to specific families were created, and images from other communities like Warruwi (Goulburn Island) and the Tiwi Islands were referred onwards. These groupings made it much easier to distinguish images that were open to public access from those that were to be set aside for private viewings by groups of men, groups of women or specific families as appropriate. As outlined in Figure 3, a third broad access category called *dhuni'* (sheltered) or *makarr-garma* (greater public) was soon created by Gumbula to protect images that are technically open to public access under Yolŋu law yet should only be viewed with guidance from an appropriate elder (Corn and Gumbula 2006:183–7). Such mediation by elders was also deemed appropriate for images of ceremonies such as the *makarraṯa* (restitution), which, while public, is now rarely practised and therefore unfamiliar to the young (Keen 1994:140).

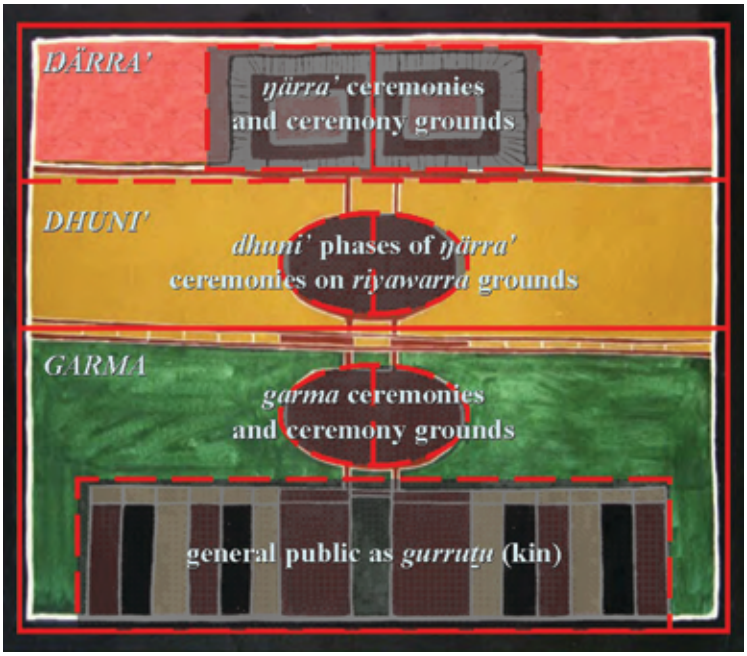

Figure 3: Traditional Yolŋu access categories and their ceremonial bases (Corn and Gumbula 2006:184)

Also built into these access categories are the responsibilities and intellectual property rights of the different Yolŋu *mala* groups who own them, and of individual elders who hold the authority to speak for them and to determine who should access them in accordance with Yolŋu law. Now that our project is complete, all external requests for access to these images can be referred to these representative elders (Corn and Gumbula 2006:175–83).

With all of these images now digitised, we have also taken steps to facilitate ongoing local access to them at Miliŋinbi and Galiwin'ku. Here our project benefitted again from Gumbula's dual status a local elder and Chief Investigator. His intimate knowledge of local family lineages enabled us to negotiate complicated Yolŋu protocols for which photographs were specific to which families and should be referred to them for independent assessment over the course of our fieldwork at Miliŋinbi and Galiwin'ku. Elders from these families also visited the University Sydney of Archives to view images there. During these meetings, women and men sat separately as they browsed through pre-sorted photograph folders, so that nothing inappropriate under Yolŋu law would be inadvertently seen by either group. Viewing images of this vintage for the first time was often an emotional and intensely personal experience for all concerned. The elderly lady at Miliŋinbi who is depicted with her family in Webb's

photographs from the 1930s was a little saddened by this experience, yet at the same time very excited.

There are several options for providing ongoing community access to these images in Miliŋinbi and Galiwin'ku. Under its developing Libraries and Knowledge Centres scheme, the Northern Territory Library has installed the Our Story databases in the Miliŋinbi community library and at the Galiwin'ku council offices. While the software that drives Our Story, Ara Irititja, was originally developed for the Pitjantjatjara communities of Central Australia, it nonetheless offers an existing local platform from which *garma* images from the University Sydney of Archives can be shown. Gumbula is also consulting with fellow Yolŋu elders about the idea of installing secondary image databases for secure elders-only access within the local arts centres at Miliŋinbi and Galiwin'ku.

In readiness for these developments, we therefore implemented a back-end form to capture the rich descriptions prepared by Gumbula for each image. This is based on the Australian Government Locator Service (AGLS) metadata standard, which incorporates the Dublin Core Metadata Element Set (DCMES), so that information fields are exportable to multiple databases. We have also planned modifications to the existing archives control system at the University Sydney of Archives to ensure that all such data is secure and that the images can be managed over time. During our fieldwork we observed people at the Miliŋinbi community library, both young and old, browsing the thousands of images that are already accessible. A noticeable lack of contextual information was provided for most of these images, which made them difficult for younger users to independently interpret. To render images sourced from the University of Sydney Archives as accessible as possible, Gumbula has therefore created a detailed description for each image in both Yolŋu-Matha and English that will be embedded with its metadata.

Wherever an individual in an old image has not yet been identified, the term *ŋaḻapaḻ Yolŋu* (elder person) is used to ensure that young users know to view it with respect. In this way, these images can be an important education tool for use in cultural events at school whenever elders visit. Elders presently come to the Miliŋinbi community library twice a week to talk to schoolchildren about Yolŋu culture. So to be able to see images of the first decades of mission settlement and know the names of the people they depict is an enormously valuable cultural resource that offers local children a new way of feeling connected to their recent ancestors. They can also see all the familiar parts of their hometown and how they used to look, which is a powerful catalyst for instructive discussions about tradition and change in the past, present and future.

At the completion of this initial ARC project in February 2009, Gumbula had identified and described in his own language, Yolŋu-Matha, more than 870 images held at the University of Sydney Archives. As a result of this unprecedented undertaking, Yolŋu communities can now access and use many of these images, and the University of Sydney Archives can now manage them in a way that is consistent with Yolŋu law.

A small number of these images were displayed in 2009–10 in *Makarr-Garma*, Gumbula's debut exhibition at the University of Sydney's Macleay Museum, and, longer term, they will be locally available to Yolŋu communities at Miliŋinbi and Galiwin'ku for learning, discussion and refinement of their descriptions, and for stimulating new awareness of Arnhem Land's recent history.

As our project unfolded, we also started to investigate collections containing other early materials gathered by Warner and Webb. These are housed in institutions throughout Australia, Europe and North America, such as the Museum der Kulturen in Basel and the Field Museum of Natural History in Chicago, and Gumbula commenced a second ARC major project in February 2010 to examine this international diaspora. Earlier materials collected at Miliŋinbi by GH Wilkins in 1924–25 have also been discovered in London at the British Museum and the British Museum of Natural History (Wilkins 1929). These, too, will be explored and, over time, it is hoped that digital copies of all such materials in international collections can be made available to Yolŋu communities for ongoing local access.

Yolŋu look forward to a time when all such materials, including recordings of *manikay* and *buŋgul*, are available for ongoing local access as educational resources for future generations. Like the old people who initially collaborated with the early ethnographic collectors, contemporary Yolŋu seek to define themselves in an ever-changing world and can make good use of these materials in negotiating this challenging endeavour. With the return of these images from the University of Sydney Archives to their communities of origin, Yolŋu elders can now take control of their use and dissemination for the benefit of future generations and the wider international community.

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Chapter 13

Photographic legacies: Missionaries and anthropologists in Arnhem Land

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Abstract: *This chapter was first published in* Mali' Buku-Ruŋanmaram: Images from Miliŋinbi (Milingimbi) and surrounds, 1926–1948/chosen and described by Joseph Neparrŋa Gumbula *(Gumbula 2012). It stems from work that the University of Sydney Archives undertook with Yolŋu elder Joseph Gumbula between 2006 and 2009 as part of an Australian Research Council (ARC) Indigenous Research Fellowship he held. It is a reflection of the implications for archives in managing these particular records, and the opportunities and challenges faced by institutions in providing access to records to remote communities. The section on access directions draws on the ideas developed by Gumbula and his mentor on this ARC project, Aaron Corn.*

Aboriginal records at the University of Sydney

The University of Sydney Archives holds a significant series of records about Aboriginal communities from across Australia. The holdings are a mixture of personal and family archives, anthropological field research, and Department of Anthropology administrative records. They include field research, genealogies, language notebooks, correspondence, reports, printed articles, photographs, audio discs and film that date from 1910 to 1979.

The majority of these records were created or collected by the early professors of anthropology at the university, Professor AR Radcliffe-Brown and Professor AP Elkin. The Chair in Social Anthropology at the University of Sydney was inaugurated in 1926 with teaching and research responsibilities. One of the main activities undertaken by the Chair was the administration of the Australian National Research Council Committee on Anthropological Research, which received monies from the Rockefeller

Foundation to fund fieldwork in regional Australia and the Pacific (Gray 2007). Thus the early departmental records include correspondence, reports and photographs from field researchers funded under this scheme, such as Hart, McConnell and Piddington. In addition, the archives hold a number of other anthropologists' archives from Australia and the Pacific, including those of Dr Annie Margaret McArthur, as well as Radcliffe-Brown's own field research from 1910 to 1915 in Western Australia and New South Wales.

Most of the holdings about Aboriginal people are located in the AP Elkin Personal Archives, reflecting Elkin's powerful position in the development of Australian anthropology both within academia and in the political sphere. However, the contents of the AP Elkin Personal Archives include much that was created by other anthropologists and observers of Aboriginal cultural practices and communities. In addition, Elkin was a recipient of correspondence and images from amateur observers of Aboriginal customs. Reflecting these diverse sources, the AP Elkin Personal Archives include early photographic images from Miliŋinbi (Milingimbi) in north-east Arnhem Land dating from 1926 that were taken by the anthropologist William Lloyd Warner and the missionary TT Webb.

These images were the subject of primary research by Joseph Neparrŋa Gumbula, a traditional elder of Miliŋinbi and resident of Galiwin'ku in the Crocodile Islands. Between 2006 and 2009 Gumbula was the recipient of an ARC Indigenous Research Fellowship, during which he worked at the University of Sydney Archives describing the images and setting access categories as they related to Miliŋinbi and Galiwin'ku communities. The University of Sydney Archives has recorded all of these rich item descriptions into its archives control system. As such, for the first time since the receipt of the records into the archives in 1982, some of the photographs from Miliŋinbi and Galiwin'ku have been opened to public access. However, while we now have a much greater knowledge about these records, there remain significant issues in managing access and accessibility.

William Lloyd Warner

William Lloyd Warner's fieldwork in Australia in 1927–29 has been recently documented by Geoffrey Gray (2007) and Louise Hamby (2008). Warner was a graduate of the University of California, Berkeley, and came to Australia on a Rockefeller Fellowship in 1926. Receiving funding from the Australian National Research Council Committee on Anthropological Research, Warner was the first anthropologist to conduct fieldwork among the Yolŋu of north-east Arnhem Land. At the time, the Methodist mission at Miliŋinbi, which had been founded in 1924, was the only Yolŋu town in existence, although it was not the first mission in Arnhem Land, which was at Warruwi (Goulburn Island). Yirrkala was established in 1935 and Galiwin'ku in 1942.

Early in 1927 Warner travelled to Miliŋinbi via Darwin, with photographic equipment and a wax cylinder sound recorder. The 387 images he took in Arnhem Land over the following year, spanning 657 negatives and prints in total, are now held in the University of Sydney Archives. Only a small fraction of these were reproduced in Warner's (1937) seminal book on Yolŋu society, *A Black Civilization*. The remainder are unpublished. There is a register of 227 images and captions, which was created by the Department of Anthropology in the 1920s, that correlates with the numbering on the larger prints, although prints are missing from the set. Part of the ARC project (the Gumbula project) has required unravelling the relationship between the different formats of images: 3 × 3½-inch prints, 6 × 8¼-inch prints and quarter-plate negatives, and the catalogue descriptions. While there is a deal of duplication across the different formats, there are more prints than negatives, and while the larger prints are catalogued, there is not an exact correlation between them and the negatives. In addition, both the Macleay Museum (at the University of Sydney) and AIATSIS (in Canberra) hold images taken by Warner, some of which are not in the archives' holdings.

The two main themes in the body of images taken by Warner are those of ceremony and exploration. The images document his travels north through Tennant Creek to Katherine, through southern Arnhem Land to Darwin and Melville Island, and across to Miliŋinbi. Warner observed three men's ceremonies and two *makarraṯa* (restitution) in his time at Miliŋinbi, which he wrote about in publications in the Department of Anthropology journal *Oceania* (1931, 1932) and in *A Black Civilization*. The men's ceremonies are sacred and restricted images, while the *makarraṯa* and a number of images from the public part of the major ceremonies are considered by Gumbula to require mediated access with elders (*dhuni' makarr garmamirr* (sheltered)). There are also a number of images of Warner's travels through the Crocodile Islands, to places like Goyder River, Buckingham Bay, Wessel Islands, Arnhem Bay, Cadell Straits and Elcho Island. In the absence of a written narrative of his fieldwork, by using Google Earth it is possible to trace the landscape of the islands and track Warner's paths.

The Reverend TT Webb

Warner's host at Miliŋinbi, the Reverend TT Webb, had arrived there to administer the fledgling mission town on behalf of the federal government in 1926. Webb took an active interest in what Warner and other anthropologists wrote about north-east Arnhem Land, beginning a correspondence with Elkin in 1933 that continued sporadically until Webb's death in 1949. Warner's two monographs in *Oceania* led to Webb writing a riposte in 1933. It was a difference of opinion exacerbated with the publication of *A Black Civilization*, and Webb, on the ground in Miliŋinbi, continued to criticise Warner's terminology and understanding of kinship, and detail his own layman's understanding of Yolŋu law and cultural practice. Webb came in for criticism from anthropologists like Radcliffe-Brown and, to some extent, Elkin, during what became

known as the 'Murngin controversy', in which anthropologists debated Warner's use of the generic term Murngin to describe north-eastern Arnhem Land tribes.[1]

However, not all his correspondence with Elkin was in a critical vein. Webb sought linguistic advice to assist his transcription of Yolŋu language, and he was happy to share his own field trip findings and photographs with Elkin. He wrote in 1939, 'I have been so fully occupied with imperative station duties that I [have] not been able to devote myself to a real study of the beliefs, customs and language of these people as I should have been able to do' (AP Elkin Personal Archives, P130/5/49, Webb to Elkin, 27 June 1939).

Webb lived at Miliŋinbi with his family until 1939, and on his return to Victoria he documented his observations of Yolŋu life in a 192-page manuscript called 'Aborigines and Adventure in Arnhem Land' (AP Elkin Personal Archives, P130/5/97, undated). It was submitted to Elkin for editing in 1947, along with 188 illustrative prints from Webb's own collection. However, Webb died in 1949 with his book unpublished and these records became part of the AP Elkin Personal Archives. Webb's manuscript serves as the most comprehensive account of his time at the mission. He discusses Yolŋu economy, food, social organisation, language, material culture such as woven objects and canoes, and ceremonial life, as well as certain incidents that occurred during his time there between tribes, the surrounding landscape and associated myths, climate, development of the mission area, death, magic, medical work of the mission, the 1932 Caledon Bay incident, law and justice, education and Christianity. The photographs he sent to Elkin were provided as illustration and while each is captioned, there is no clear association between particular text and images. While a certain number of images are ceremonial and restricted, two-thirds are images of Miliŋinbi people and the surroundings, and their daily life under the mission.

Elkin, McArthur and McCarthy

In 1946 Professor Elkin visited Miliŋinbi and Galiwin'ku during a short tour to north-east Arnhem Land and Central Australia. The settlement at Galiwin'ku was newly formed; many of the Miliŋinbi community had moved there in 1942 for safety during the Second World War. Miliŋinbi had been bombed and the Methodist Overseas Mission established the settlement with Father Harold Shepherdson, a long-time assistant of Webb. There are a few images taken by Elkin at that time, including of the 'excellent timber yards' (AP Elkin Personal Archives, P130/5/1, p.156). Elkin was seemingly only a short time at Miliŋinbi, perhaps en route to Croker Island, where he was inspecting the mission there. He took, however, a wonderful photograph of three Yolŋu women returning from hunting, one of whom is Gumbula's mother and one a Miliŋinbi elder who is only recently deceased.

Two years later, in 1948, members of the Australian–American Scientific Expedition led by Charles P Mountford spent several months in Arnhem Land, principally

at Groote Eylandt, Yirrkala and Oenpelli. Dr Annie Margaret McArthur was the nutritionist on the expedition, and in her personal archives held at the University of Sydney Archives are a number of photographs from communities in the Northern Territory, including Yolŋu. Her personal archives include copies of photographs taken in Miliŋinbi by Frederick McCarthy from the Australian Museum, another member of the expedition. While the archives hold only a very small number of the images taken by McCarthy, the photographs of Miliŋinbi from the 1940s were of great interest to Yolŋu. Many of these images are scientific in approach, depicting front, side and back portraits of groups of young men, and for that reason they are not open access, except where the families of the subjects have agreed. The subjects in these later photographs were often the most enthusiastically viewed and well recognised by many in Miliŋinbi. This highlights the fact that the photographs from the 1920s and 1930s are really on the edge of living memory, and hence the importance of the Gumbula project and others like it being undertaken with some urgency.

Access categories

The primary aim for Gumbula has been to ensure that each image has an appropriate access category based on Yolŋu law. Great care has been taken to ensure that images of anything that is restricted from public access under Yolŋu law are not inappropriately displayed. At the project's outset, images were sorted into two broad access categories, *garma* (open) and *ŋärra*' (restricted), before being further refined into narrower topical sets. Images of specific ceremonies were grouped together, and folders related to specific families were created. These groupings made it much easier to distinguish images that are open to public access from those that were to be set aside for separate viewings by men, women or specific families.

A third broad access category, *dhuni'makarr garmamirr* (sheltered), was also created by Gumbula to protect images that are open to public access but that should only be viewed with guidance from an appropriate elder. For instance, Gumbula suggested mediated access is appropriate for images of ceremonies such as the *makarraṯa*, which, while public, is no longer practised with any frequency and is therefore unfamiliar to the young. In general, many of the images taken by Warner in 1927–28 depict ceremonial practices and are categorised as restricted, while the vast bulk of the images Webb took are open to public access.

Built into the access categories are the responsibilities and intellectual property rights of the different Yolŋu *mala* (patrifilial groups) and individual elders who hold the hereditary authority to speak for them and to determine who should access them in accordance with Yolŋu law. The aim is to direct the researcher to the local community to seek out the person with the authority to help them. The information is provided as a first point of contact and in some cases families will refer the researcher to other

people to contact. The Milingimbi Community Council is the default owner of the intellectual property.

In addition to clarification of access categories, the project has endeavoured to provide rich description about each image in Yolŋu-Matha, identifying people where possible and ensuring that images can be placed in time and culture. The aim has not been to find the definitive story about an image, but, rather, to give the younger generation of Yolŋu the ability to read images from up to 80 years ago, to understand that the image is of an elder who should be respected, of a public event such as the New Year's Day events during mission times, and of the location of mission houses and plantations in relation to the town as it now stands. These rich descriptions are for the *garma* and *dhuni'* images only. Limited metadata is provided about the restricted images, as these are only for the elders to view and discuss as appropriate. While the inscriptions provided by Warner for one set of his prints and negatives are recorded in the database, these will not be made available to researchers or Yolŋu unless requested by elders. Many of the inscriptions are of ceremonial events, and hence restricted, or are written in culturally inappropriate language so do not form part of the publicly available metadata.

Archives and Indigenous records

Over the past two decades there have been many pressures on archival institutions to improve their management of Indigenous records. Issues raised have included Indigenous staffing, accessibility, description and control. The push for improved services has come from Indigenous communities and in response to broader social and legislative changes. Both the 1989 Royal Commission into Aboriginal Deaths in Custody and the report into the Stolen Generations, *Bringing Them Home* (HREOC 1997), made recommendations relating to the management and retention of archival records concerning Indigenous communities. There has been growth in genealogical research undertaken by organisations like Link-Up, which was first formed in 1980 in New South Wales and, since 1997, has been a national program, and also in the wake of the introduction of the *Native Title Act 1993* (Cth). There has also been the emergence of Indigenous community and heritage centres, and museums across Australia.

More generally, there has been an increased awareness by archivists of the difficulties they encounter in managing records of Indigenous communities. Archivists outlined the paucity of specialist advice, particularly with reference to the management of and access to secret sacred material (Anemaat 1989), and highlighted the need for proactive involvement of archival institutions in community projects. Such involvement includes providing copies of records, archival advice and training, Aboriginal employment and involvement in management and advisory bodies, identification of Aboriginal records, and access policies (Berzins 1991). Indigenous researchers such as Sonia Smallacombe (1998) wrote of the great difficulties accessing information about themselves and their

families. In response, policies, memoranda of understanding between institutions, and best-practice standards and protocols were developed, such as the *Aboriginal and Torres Strait Islander Protocols for Libraries, Archives and Information Services* (ATSILIRN 1995[2005]). Archives have made many changes in their practices, including the development of indexes, issuing warnings about content, developing connections with communities, and increasing Indigenous staffing and training. Nevertheless, there remain many difficulties in delivering improved services to Indigenous communities, particularly given the lack of resources to overcome issues of distance.

The University of Sydney Archives has experienced many of the issues discussed in the literature about Indigenous archives. While there is a comprehensive guide to the AP Elkin Personal Archives (University of Sydney Archives 1982, rev. 1998), it was prepared by a non-archivist on behalf of the Department of Anthropology in 1982 and, in particular, lacks an Aboriginal presence. The lack of specific information about clans and language groups has become more evident as the need for such index points has developed with research on native title and family and community history. In 2011 the archives produced a geographic and Aboriginal language index to the Elkin and Radcliffe-Brown records, and the university is sponsoring the creation of a geospatial interface to the finding aids, which will provide a much more user-friendly access point to locating relevant records about Aboriginal communities.

Nevertheless, there remain significant issues for the archives to address. Managing access to secret sacred information in files and notebooks has been on a case-by-case basis, as records are requested, as is the practice with many archival institutions without the resources to negotiate effectively with community elders or representative organisations. The distance between source communities and records compounds these difficulties because users need to visit the archives in person to locate and view records. Moreover, the creators of records are not clearly defined within the guide, and many researchers assume, not unreasonably, the creator is Elkin. Despite these problems, the AP Elkin Personal Archives are the most highly used of the personal archives series at the University of Sydney Archives.

The Gumbula project is unique in its provision of resources to enable an extensive period to review and describe images previously inaccessible to source communities. The Indigenous photographic records held in the archives have been particularly underutilised despite the great appeal and importance of images to Aboriginal communities. Since 1983 the audio-visual records in the AP Elkin Personal Archives have been closed to general access, a decision made by the then Vice-Chancellor following representation by elders concerned about the dissemination of secret ceremonial information recorded by Elkin on fieldwork. Aboriginal communities have been provided with copies where requests have been made, usually facilitated by anthropologists researching on their behalf. However, the lack of descriptive information makes it difficult to ascertain the subjects of the images and therefore to determine the appropriate community access points. While there has been a trend

by cultural institutions to facilitate repatriation projects and visits by elders to the archives to set access conditions, the Gumbula project is the first to be Indigenous-led. For the archives, it has provided a wonderful test case for the possibilities and limitations of weaving together two, sometimes contradictory, systems of knowledge.

Project implications

While images and descriptions provide a wonderful Yolŋu cultural history of the 1920s, 1930s and 1940s in Miliŋinbi, and in a small way Galiwin'ku, there remain significant delivery issues for Yolŋu community use of and access to the images. Following a visit to Miliŋinbi, the project decided the Northern Territory Library's Library and Knowledge Centres (LKCs) structure might prove suitable for the delivery of the *garma* images to Miliŋinbi and Galiwin'ku. The LKC model began in 2004 as a means of assisting the repatriation of local material and preserving photographs, tape and video recordings, and documentation. It uses the Ara Irititja software, produced originally by and for the Pitjantjatjara community in South Australia but rebranded as Our Story for use by the Northern Territory Library (NTL). The Ara Irititja model has been employed across many Aboriginal communities, including the Victoria-based Koorie Heritage Trust and the Juluwarlu Archiving Project in Western Australia.

However, the implementation of LKCs in the Northern Territory has not been without challenges (Nakata et al. 2007; Richmond 2005). Our Story software is designed to allow for cultural sensitivities and sorry business through password protection, but it requires active management to work effectively as a means of managing culturally restricted records. In Miliŋinbi there are more than 5000 images, predominately from the NTL's resources, uploaded to the database in the LKC based at the local school. Implementation in Galiwin'ku has been more piecemeal, but since 2008 a terminal has been installed at the Galiwin'ku Community Council. The LKC structure is flexible and can be used to manage restricted records, but it requires the community to provide the infrastructure and staff to actively manage cultural business (Nakata et al. 2007:220). Neither Miliŋinbi nor Galiwin'ku has a cultural centre that manages men's and women's business, and sensitive and sacred images repatriated from archives and museums are not currently included in the LKCs.

The decision of the University of Sydney Archives and Gumbula has been to produce a two-part printed companion of *garma* and *dhuni' makarr garmamirr* images (Gumbula 2012). These are arranged by subject matter to show mission life, traditional Yolŋu practices, the travels that Yolŋu undertook with Warner to the northern tip of the Crocodile Islands (Wessel Islands) and public ceremonies including *makarraṯa*. It is anticipated that the hard-copy publications will be available in shire councils, community and school libraries, and art centres.

These printed companions are a response to Gumbula's concern about unmediated access to images within essentially mainstream library environments. Hopefully, some

of the images will be uploaded to the Our Story databases in Yolŋu communities, and people will request copies of images for use in other community projects. However, being able to provide copies of the *dhuni' makarr garmamirr* and *ŋärra*' images to the community for access and management by Yolŋu remains a challenge where the only image database is a public terminal, and where images are available for download and re-use without any caveats. This is something that the NTL has also recognised, and recent developments in the LKC model have sought to improve the management of digital images with respect to culturally appropriate access protocols.

Gumbula's concern is echoed in recent archival studies about the delivery of archives to Indigenous communities. While digital resources have provided communities with the ability to access and use archival records previously withheld from them by dint of distance and, sometimes, complex negotiations about intellectual property and copyright, technology is not a simple panacea. Concerns about access and dissemination were highlighted in research undertaken by the Victoria-based Trust and Technology ARC project. However, that project also stresses the advantages of technology in giving Koories a voice, both by facilitating recordings of oral histories and in responding to records directly through the development of an annotation system (Ross et al. 2006). This model has something to offer the Gumbula project as well. The value of collected images lies in the memories and the conversations about the past that they generate. Both the library and the archives sector are aware of the difficulties of melding the Indigenous knowledge systems with mainstream structures. Both sectors are also aware that models work best where the communities can actively manage the technology within a trusted community environment.

Conclusion

The role of the University of Sydney Archives in the Gumbula project has been to provide support, facilitate access to copies, assist with data collection, and work through the design of appropriate and flexible systems to manage the rich description and digitised images. Because the project is Yolŋu-led, the dynamic is radically different from projects where the institution itself initiates contact with communities and seeks information about its holdings. For Gumbula, the access categories are the most important aspect of the project. The ability for Yolŋu to view, print, discuss, enjoy and debate the content of the records is made possible by ensuring that those activities occur within appropriate Yolŋu structures. In this way, the images of Miliŋinbi and Galiwin'ku taken by Warner, Webb, Elkin and McCarthy can become part of the visual history of the communities.

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Note

1. For notes relating to the Murngin controversy, see University of Sydney Archives P130/5/48, 'Notes on Murngin kinship'. See also articles by WL Warner, AR Radcliffe-Brown and AP Elkin among others in *American Anthropologist* between 1930 and 1957, plus Kenneth Maddock (1970), 'Rethinking the Murngin problem: A review article', which is a review of JA Barnes, *Inquest on the Murngin*, Royal Anthropological Society of Great Britain and Ireland, Occasional Paper no. 26, 1967.

Chapter 14

Trove: A new information destination for all Australians

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Abstract: *Trove is a destination website that provides freely available information and links to resources of relevance to all Australians. This chapter focuses on Trove's connections to numerous archives with Indigenous relevance. The National Library of Australia has a significant track record in working with cultural and research organisations around Australia to support the discovery of Australian content. Our collaborations, such as the Libraries Australia National Bibliographic Database, Picture Australia, Music Australia, the Register of Australian Archives and Manuscripts, and Australian Research Online, have coalesced into Trove, a new discovery engine located on the World Wide Web at <http://trove.nla.gov.au>.*

After being in prototype for seven months, Trove was released as an ongoing service in December 2009. It has become an essential starting point for discovering information about Australia and Australians. Trove offers a single search across the descriptions of 350 million items including books, video and sound files, images, manuscripts, original research and newspaper articles. Many of the items are available for viewing online.

All of the original services may be categorised as aggregations. That is, they collate descriptions and direct searchers to items wherever the items are managed. Trove has taken discovery a further step by seeking out and adding sources of freely available full text, such as the Open Library's digitised books and the Hathi Trust's shared digital repository. These two international initiatives are digitising books in academic and other collections outside Australia. The collections contain some out-of-copyright Australian items and include Indigenous histories.

However, there is a significant point of difference between the old services and the new. Trove recognises the importance of engagement with the public, and provides tools for this purpose. Searchers can add tags, comments and rankings

to any format of material. They can create lists of items of interest. An industry of text correction has been established by searchers themselves around the digitised full texts of newspaper articles. These types of annotation have engendered new ways of thinking about and using such resources, which has turned Trove into a rich destination site in its own right.

Introduction

In December 2009 the National Library of Australia launched a new service called Trove. Its name derives from the well-known concept of a treasure trove. Trove was developed to make finding and getting information easier for all Australians. The service searches across a rich data repository of more than 350 million items, as described by 1000 libraries and other organisations, and will continue to grow. For more than four years, the National Library has worked to reduce the number of silos created for discovering information.

To appreciate the breadth of content available, Trove was originally divided into eight zones. Behind each zone was content already available, albeit in separate spaces online. So, for example, the 'Books, journals, magazines, articles' view contained most of the records in the service known as Libraries Australia.[1] The service now has ten zones.

In the 'Pictures and photos' zone is Picture Australia,[2] which contains two million pointers to digitised images of Australiana. The zone also has records for images not yet digitised, but these are often available on request. In 'Digitised newspapers and more', 100 million articles are available for reading and annotating, and they are being added to in a continuous program. By June 2013, another 10 million pages from Australia's major metropolitan dailies and selected regional newspaper titles had been made available.

The 'Diaries, letters, archives' zone represents manuscripts that are often not digitised, but their finding aids are indexed. The 'Maps' zone contains records for maps that may or may not be digitised. The 'Music, sound and video' zone contains links to audio books, as well as music soundtracks, digitised sheet music and oral history interviews, including those recorded for the Bringing Them Home Oral History Project.[3] This zone will also become the discovery point for interviews of the Forgotten Australians and Former Child Migrants Oral History project.

The 'Archived websites' zone provides links to content in the national web archive, PANDORA.[4] The 'People and organisations' zone is built on the Australian Authority File. Trove's key feature is its single search functionality across different types of content and formats. Some services have already been integrated into Trove and their separate interfaces removed from view. These include the Register of Australian Archives and Manuscripts, and the Australian Newspapers service.

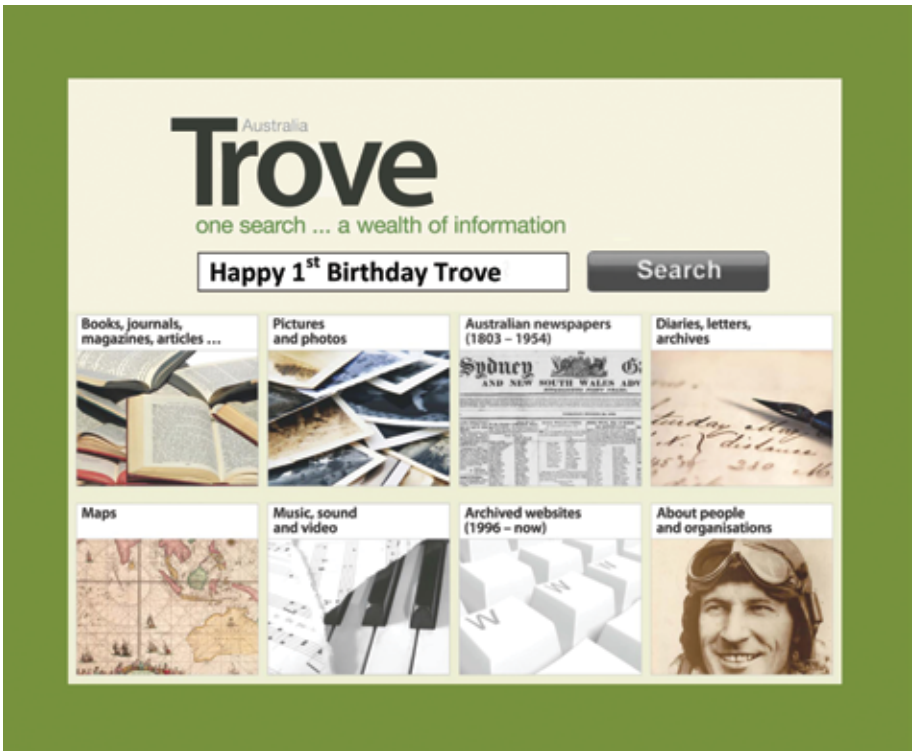

Figure 1: The home page of Trove, July 2010, showing the original eight zones

New generation searching

While a single search is important for ease of use, it is possible to browse through each zone one at a time if research confined to one type of content is important for discovery. Filters are also available on every search page for online content only, content held in Australia or content held in specific geographic locations. Any combination of these three filters may be applied. The geographic filter is important for expediting access to print-based materials through local libraries or confirming the location of three-dimensional artefacts that cannot be moved around the country before a visit.

Searching can be further refined by the use of facets such as format, decade and language. The facets displayed are tailored for each zone. Results may be sorted by keyword relevance, earliest date and latest date.[5] A search for information about the Wakka Wakka language reveals books, articles, theses and an entry for the Wakka Wakka Wadja Wadja Regional Council. Such bibliographical details often originate in Libraries Australia and rely on the work done by library staff across the country. By making sure that the publications of organisations are catalogued into Libraries Australia, an authoritative entry will appear for them there and in Trove.

Each individual or organisation that traverses the National Library's People Australia program is assigned a unique party identifier. The word 'party' collectively means person or organisation. The identity entry for a person may result from a collation of information harvested into People Australia from other sources as well, as shown, for example, in the entry for Oodgeroo Noonuccal.[6] The National Library amalgamates all of the information about the person under the identifier without changing any details. Aliases are also matched. The aim is to keep the identifiers persistent, so they can be cited and reused, and they are provided back to the organisations that shared their records with People Australia.

In 2010–11 the National Library was granted funding to extend the identity infrastructure for use in the higher education sector.[7] The intention is to use Trove to co-locate all of the published works held in libraries, and unpublished works held in institutional repositories for each author or creator.

Content not held in Australia

Although Trove is an Australian service, and content from as many libraries, archives and museums as possible has been included, it aims to make it easier for people to have access to other relevant sources. Three targets are searched in real time: Amazon, Google and Wikipedia. The National Library has also identified some sources of digitised full text to include.

The Open Library is hosted by the Internet Archive, which has worked with libraries for many years to save websites. By mid-2010, the Open Library consisted of some 1 133 412 out-of-copyright digitised works.[8] Similarly, more than 800 000 full-text digitised works held by a group of United States academic libraries are available from the Hathi Trust digital library.[9] Permission was not sought to include these sources, as they are available via an open access point. These are complemented by harvesting more than 21 million records in the OAIster catalogue that describe and link to international scholarly resources.[10] There is an immediate benefit to Australian scholars, as the digitised copies are available in real time. There is also a benefit to Australian libraries, as they do not need to expend funds on digitising these particular works unless different editions of significance to scholars are held.

Some of the digitised books in the Open Library and the Hathi Trust are Australian. Because the works are out of copyright, they may represent the thinking of previous generations, but finding the information and using it in such an easy way is irresistible. These renditions of forgotten languages and customs may be the only record of their existence.

Each work in Trove is labelled with one of three appropriate access statuses: 'available online', which means it is possible to click through and read the work; 'possibly online', which means the descriptive metadata does not provide enough information about access; and 'access conditions apply'. Works may sometimes be assigned the

wrong category of access, so it is worth following a link in case it is freely available or a preview or a sample has been made available.

These large aggregations of content, including Trove, which provides full access to digitised Australian historical newspapers from 1803 to 1954, often provide their own page turners that work in any browser. Within each work it is possible to find different versions or editions, and, from there, to ascertain items that are available for borrowing through a local public library, copying via a library service, or purchasing from Australian and overseas booksellers. The copyright status and citations for works are also displayed at the click of a button.

Trove as a research tool

Trove is more than just a search engine. It provides functions to facilitate research activity. Trove aggregates an extraordinary amount of content for use by all Australians. Where managers of university libraries' institutional repositories and state libraries' unique heritage collections work with the National Library to create awareness of Australia's intellectual output, Trove encourages its reuse in a multiplicity of ways. Trove provides functions to facilitate the sharing of content in other networked spaces, such as Facebook and Twitter, but there is an important emphasis on supporting research.

Although it is not mandatory, anyone can set up a profile in Trove. This allows an individual to set library preferences; keep a history of annotations to content in the form of tags, comments and text corrections; and create lists. While library preferences may be personal, a tag can be shared within a research group or community interested in a particular topic. Subsequent searching by tag can then reveal all content previously discovered by the group.

Text corrections may be made to the digitised newspaper articles, which have been parsed with optical character recognition (OCR) software, to create indexes for full-text searching. As OCR software does not have a 100 percent accuracy rate, due to the lower quality of some microfilmed or older newspapers, corrections are important for better search results. Corrections are done on a voluntary basis, an acknowledgment of the usefulness of the content as an extraordinary source of longitudinal information.[11] An example is the South Eastern Australian Recent Climate Change History (SEARCH) project, an initiative funded by the Australian Research Council.

Lists can be created by anyone, and kept private or 'published' to share with others. As items are discovered in Trove, they can be collected and saved in a list, which will have its own description and indication of authorship. That is, a user profile does not have to be the name of an individual. The National Library has used lists to present items according to themes, such as one with a focus on Indigenous dance.

Items can be reordered, and items not in Trove can also be linked in. In the library community, lists are being considered for the following purposes: showcasing items

in a unique collection, virtual exhibitions, teaching resource kits, reading lists/fact sheets or subject guides, collecting personal 'favourites', virtual press clippings files and tracking research (supported by the 'news' feed added in late 2010).

As part of its role to showcase Australian social and cultural content, Trove includes digital images contributed by individuals via an earlier arrangement established with Flickr for Picture Australia.[12] Commentary about the best use of Trove features, new discoveries made and research conundrums is exposed in a relatively new part of Trove, the user forum, which, although not an 'academic' forum yet, has the potential to become so.

Community offerings of Trove

In addition to personal forms of engagement with Trove, there are several ways the service can be offered to communities via their own websites. The Trove search box and pre-constructed searches using single URLs to feature a subset of the Trove corpus are easy to implement on any website.[13] Various query protocols for incorporating some of the data that make up the Trove repositories into other platforms are also effective. However, a machine interface for the entire corpus, including some full text, is still being scoped (Campbell 2010).

The Trove team welcomes contact regarding the inclusion of content from communities. A range of methods focusing on record sharing has been proposed, and as a result of using these methods a greater awareness of what communities offer is generated, as Google and other search engines harvest Trove periodically. Trove provides summary statistics that count referrals to the collections of organisations collaborating with Trove.[14]

In summary, a destination

Trove is a product of the ongoing collaboration between Australian libraries and other organisations interested in public outreach. Trove provides a wealth of information about our culture and our intellectual output in conjunction with tools to explore and realise its enormous potential for education, research and enjoyment. We hope it is a rich experience for all Australians.

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Notes

1. Libraries Australia is a subscription-based resource-sharing service managed by the National Library of Australia.
2. Picture Australia was a free service hosted by the National Library of Australia for showcasing the digitised image collections of cultural significance.
3. The Bringing Them Home Oral History Project ran from 1998 to 2002 and served to collect and preserve the stories of Indigenous people and others, such as missionaries, police and administrators involved in or affected by the process of child removals.
4. PANDORA, Australia's Web Archive, is a growing collection of Australian websites, online publications and web logs established initially by the National Library of Australia in 1996, and now built in collaboration with nine other Australian libraries and cultural collecting organisations.
5. A full description of the relevance ranking and other techniques used in Trove is available at the National Library of Australia's wiki (Dashboard 2010).
6. See Trove, search results for "Oodgeroo Noonuccal", National Library of Australia, http://trove.nla.gov.au/result?q=Oodgeroo accessed 27 May 2013.
7. See the Australian Research Data Commons Party Infrastructure Project page of the National Library of Australia's website at <https://wiki.nla.gov.au/display/ARDCPIP/ARDC+Party+Infrastructure+Project+Home> (accessed 6 December 2010).
8. The Open Library (n.d.) is a freely available service hosted by the Internet Archive, which has as its goal, 'One web page for every book ever published'.
9. The Hathi Trust (n.d.) 'is a partnership of major research institutions and libraries working to ensure that the cultural record is preserved and accessible long into the future'.
10. OAIster (n.d.) is 'a union catalog of millions of records representing open access resources' hosted by the Online Computer Library Center.
11. The Australian newspaper text correction guidelines (Manley 2010) were developed by the enthusiastic volunteers who regularly correct inaccurately interpreted text.
12. Although the Picture Australia service no longer operates, individual contribution remains possible via a Flickr group called Trove: Australia in Pictures. All images

originally contributed to Picture Australia via this pathway are still visible in Trove (Flickr n.d.). The Flick group holds more than 130 000 photographs contributed by more than 3000 members.

13. An example of a pre-constructed search is the following string, which retrieves a range of Australian resources available online for Kamilaroi and Kurnai kin: <http://trove.nla.gov.au/result?q=kamilaroi+and+kurnai&l-availability=y&l-australian=y>. Further information on how to construct permanent searches is available in Trove help.
14. For example, 'Clicks on external links', <http://trove.nla.gov.au/system/stats?redirectGroupingType=host#links> accessed 8 December 2010.

Chapter 15

Crashes along the superhighway: The information continuum

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Abstract: *When the term 'information superhighway' was coined in the mid-1990s, it was a metaphor for both the speed with which information could be transmitted and accessed in electronic form, and the speed with which the technology for this transmission and access was changing. Optimism about increased access to and democratisation of information often belies the complications associated with internet protocol negotiations, commercialised product, rapid and often incompatible developments in hardware and software, and ultimately the transient and ephemeral nature of digitised and born-digital information. Add to this the complex technical issues relating to the digitised world, and it is clear that the speed of information technology (IT) developments along the superhighway can often lead to information fatalities. Part of the reason for such fatalities is the technical complications related to archiving and storing electronic data. However, while those on the ground wait for the IT technocrats to develop integrated guides and standards for the preservation of electronic records, important digital and born-digital records are being jeopardised or lost. While traditional, physical forms of record-keeping — paper, art and objects — may be lost due to poor preservation practices, there are nonetheless guidelines around their care and preservation that are clearly understood. Such guidelines include national and international record-keeping and archival standards, as well as agreed professional practices. More importantly, these guidelines are well documented and readily available, and they provide a good model for effective programs for the preservation of digitised and born-digital material that can be implemented in small*

organisations and communities. For example, simple conservation practices relating to choice of materials, environmental parameters for handling and storage, filing and record retrieval, and physical care are all relevant for preserving digital content.

Introduction

The rollout of the National Broadband Network (NBN) has been heralded as 'a key nation building project [that] will stimulate the economy and help drive Australia's productivity, transform service delivery in key areas such as health and education and energy efficiency applications and…connect our big cities, regional centres and rural communities' (Australian Government 2011). For some Indigenous communities, this initiative will enable access to a range of services that many other Australians currently enjoy. These include access to a wider range of online education and training programs, improved access to medical support and information, more sophisticated and direct marketing of art and cultural products, and much broader social networking opportunities. The ability to transmit cultural knowledge through the internet, and to preserve cultural activity, including songs, dances, storytelling and other forms of cultural and customary practice, through the creation of digital records is already an important part of community IT projects and the Indigenous media sector (AIATSIS 2010; Christie 2005; Ormond-Parker 2009; Thorner 2010; Verran et al. 2007).

The attraction of new media for young people makes the digital world not only a potent tool in content capture and delivery, but also an effective tool in cross-generational engagement that empowers elders who want important knowledge to be available to youth, and empowers young people as agents in the preservation of this knowledge. As Inge Kral (2010:9) notes:

> In one location, young men who have acquired media skills through non-formal training with Warlpiri Media are independently accessing film-making resources in the 'old BRACS [Broadcasting for Remote Aboriginal Communities Scheme] room'. Here they are making music videos and cultural documentaries with elders, subtitling them in the local language or English, and uploading them onto YouTube, in tandem with creating contemporary digital artefacts for the community database.

Information technology and the use of the internet enable forums and pathways for sharing Indigenous culture with the outside world with 'great potential to improve the wellbeing of Aboriginal and Torres Strait Islander peoples and to support the Australian Government's policy objectives in Indigenous affairs, in particular the Council of Australian Governments' (COAG) *Closing the Gap* initiatives' (Office for the Arts Department of the Prime Minister and Cabinet 2010:12). It provides an immediate, easy and relatively cheap method for producing and distributing content

within community, unlike other forms of cultural engagement that involve travel either into the community as a tourism experience, for example, or out of the community, such as with touring dance troupes and other forms of Indigenous cultural exhibition. Technology allows people to access integrated information, such as images of dancing with links to song series, translations and explanations, and geographical overlays, making the internet a very effective means for building information, knowledge and identity. Kral (2010:14) concludes that:

> [W]hen young people have access to resources and activities are tied to meaningful community projects they are engaging as the mediators and facilitators of digital literacy in collaborative, participatory, intergenerational activities. These activities positively affirm their contemporary Indigenous identity as well as their 'belongingness' to globalised youth culture. Most significantly however, these outcomes are demanding a reassessment of preconceptions about youth literacy in this domain as through these multimedia platforms young people are exploring and developing new multimodal forms and creative literacies.

While the uptake of these multimedia platforms is developing and expanding in regional and remote areas, the use of the internet and demand for broadband is increasing. Unfortunately, the limited coverage offered by the proposed NBN (Centre for eCommerce and Communications 2011) optical fibre network means that many Indigenous communities will remain reliant on locally situated satellite dishes. The Indigenous Remote Communications Association (IRCA) has called on the NBN 'to implement the best possible broadband solutions for remote Australia by utilising and extending existing terrestrial infrastructure rather than relying on satellite delivery as the only solution' (Hughes and IRCA 2011:1).

This means that those managing IT content in these communities will remain reliant on local solutions and responses to data loss and data recovery. Requiring good management of content is not just a remote community issue. Good preservation strategies and practices for data security and disaster preparedness are critical to any local preservation system where only one copy of a particular record may be created.

In 2007 a report was commissioned by the UNESCO Memory of the World program and prepared with the support of the Australian Partnership for Sustainable Repositories. It concluded (Bradley et al. 2007:3):

> [T]hat a functioning preservation system must consider all aspects of…digital repositories; Ingest, Access, Administration, Data Management, Preservation Planning and Archival Storage, including storage media and management software. Secondly, the report argues that, for simple digital objects, the solution to digital preservation is relatively well understood, and that what is needed are affordable tools, technology and training in using those systems. An assumption

> of the report is that there is no ultimate, permanent storage media, nor will there be in the foreseeable future. It is instead necessary to design systems to manage the inevitable change from system to system. The aim and emphasis in digital preservation is to build sustainable systems rather than permanent carriers.

This chapter examines the practical issues associated with preserving digital content that is developed and/or held within Indigenous communities across Australia. Regardless of national delivery initiatives such as that promised through the NBN, it remains the case that without addressing the increasingly complicated, unresolved and compounding issues around preservation, most of the historical material developed in digital formats in the late twentieth century and the early twenty-first may be rendered inaccessible and invisible to future generations.

Effective preservation for digital content

The most effective way to ensure that digital content survives is to have a clear plan for both the creation and preservation of digital information. In the past, this was much easier. When paper was expensive and when few people were literate — for example, in Europe in the fifteenth century — information generally had to be seen to be significant before effort and expense were put to recording or preserving it. In societies where significant knowledge is transmitted through performance, oral transmission and ritual, significance was determined by elders and then maintained over generations. In both cases, the transfer of information relies on an informed assessment of its significance and context. Things are different in our digital world, however, where creation and transmission are much easier, and highly significant material can be created and transmitted as easily as twittering. This results in large amounts of content being created easily, but with little forethought for future use. This presents immense challenges (Brogan 2009).

Digital cultural content is created in a number of ways. An object may be digitised to create a museum record, advance a sale, allow access to catalogue information or to simply share between friends. At some stage, if the object is destroyed, sold or lost, this digital version may be the only version of the original that is available. Other content is born digital as a record of cultural practice, or as a new creation. Born-digital material may also have versions that remain after the original version is no longer available. The preservation of digital content is therefore important for recording cultural objects and practices, and for developing new content and new ways of transmitting culture. Unfortunately, content held in digital formats is easily jeopardised if issues relating to the security of hardware, software and formats are not dealt with. In all areas incompatibility, obsolescence, damage, and different or irregular maintenance regimes can result in the loss of content. The effective resolution of these issues relies on managing:

- digital content (its creation, format and archiving)
- the organisational and management environment (capacity, capability, strategies and policies including support from other organisations or peak bodies)
- relevant external support (for example, for training, financing new equipment and software)
- the provision of an up-to-date and compatible technical environment (the ability to access cluster systems, for example, or on a more basic level the ability to access appropriate IT support as needed) (Digital Preservation Europe).

In most cases, preservation issues for digital content remain the same as for any type of record that is worth preserving.[1] First, the significance of the item has to be identified and tagged in a way that enables retrieval. Second, there needs to be a management plan to ensure that the record is preserved in accordance with a proper system for retrieval and use, and that the standards of preservation offered by various forms of back up are understood. Third, a risk management strategy needs to be in place to identify current and future risks to the record, and a disaster preparedness and response plan needs to be prepared and ready for effective activation when needed. Finally, the content should be preserved in line with an effective preservation strategy. In most cases, very little of this is presently done systematically or consistently enough to ensure that valuable digital records will be available for future generations.

Content management and identifying significance

Establishing a key to significant material held in databases, in files on computers, on mobile phones, or other hardware enables people managing such content to identify what is important to preserve. Developing this information 'hierarchy' determines what information is most important, and where a particular piece of information fits with other information to which it relates. Without this context, content is easily lost — for example, when only one page from a website is captured — and, with time, there may be links that no longer work, which compromises the meaning of the preserved page.

IT records are produced and transmitted in various formats, including physical transmission such as on memory sticks, external hard drives and CDs or DVDs, mobile phones and across the internet, and are modified through use, either through content additions or deletions, or through the need to make them compatible with other software. Strategies for preservation therefore need to be established when content is being created by identifying what is important and embedding this into production in the same way that hardcopy, archival quality paper and storage methods are chosen for critical documents. For example, records are generated as office applications or business-generated information systems, including word processor documents, spreadsheets, customer relationship management programs and financial systems; in online and web-based environments including intranets and public websites; as part of

electronic communication systems like email, SMS, MMS and videoconferencing; as part of creative endeavours producing music and image files, or born-digital art forms; or as part of research that produced, for example, records of bilingual programs. Yet not all of these need to be preserved in perpetuity.[2]

Digital technology makes it easy to create a significant document. But unless the content is tagged as significant at its point of creation and put in a file with appropriate names and pathways for access, it can easily be lost. The National Library of Australia's Prometheus program provides a model for managing digitisation and format-shifting with appropriate metadata tagging (National Library of Australia 2009). This assists in decision making regarding the acquisition and updating of software and hardware, and is important because no matter how good the preservation strategy is for digital content, this content still relies on physical formats like computers, memory sticks, CDs, DVDs and external hard drives for access.

Most people creating digital records have experienced the dreaded silence that accompanies a hard disk crash, or the frustration of trying to access a file that simply refuses to open in an incompatible software program. Such experiences are compounded by marketplace competition and the constant release of new versions of hardware and software. Unfortunately, despite some specific projects like the document capture archive Pandora or the digital search archive Trove, and some very specific software such as Time Machine, the process of how best to archive digital records is usually reliant on locally designed information management systems.

A collection management plan is a critical document. It should include a Record Retention Schedule (Patterson 2011), as well as an assessment of the physical environment in which the records are kept, as described in the risk management assessment and strategy section below.

Some useful documents that discuss digital collection management can be found at the International Federation of Library Associations and Institutions website.[3] In particular, *Guidelines for a Collection Development Policy Using the Conspectus Model* (IFLA 2001) still provides a good overview of the decision-making process relevant to good management of digital content. The International Association of Sound and Audiovisual Archives provides a number of useful documents, including *The Safeguarding of the Audio Heritage: Ethics, principles and preservation strategy* (IASA Technical Committee 2005) and *Guidelines on the Production and Preservation of Digital Audio Objects* (IASA Technical Committee 2009).

Systems for retrieval and use

Proprietary software and hardware

For information that is born digital, successful preservation strategies are aimed at being able to continue to transfer information across generations. The format of digital

content creation and storage (that is, the software and the hardware in which content is created, stored and accessed) raises issues of compatibility and longevity. Ensuring compatibility within the various types of software and hardware when content is created and stored, as well as between software and hardware when content is being shared or transferred, is often difficult, and sometimes impossible.

Computer hardware reaches a point of obsolescence relatively quickly, and upgrading software can become a complicated process involving increased expenditure and retraining. This poses a number of critical preservation issues. Having programs that have been unevenly upgraded or shifting information to new IT equipment may mean that even records created at the same time may have poor interoperability. The failure to maintain software updates may increase incompatibility, and the risk increases with each new product update. In addition, some formats are not suitable for the long-term retention of information. For example, jpg files are 'lossy', meaning that they lose information every time the file is opened and saved until they are no longer readable and the image is no longer visible (Fulton 2010).

The speed at which technology is changing poses considerable problems for anyone wanting to build an effective archive system. The relatively immediate changes in computer technology mean that most computer hardware has a lifespan of between two and five years. After this, the technology is superseded, and it becomes difficult to access support to maintain the hardware (Kyrnin 2011). This may result in the loss of information that is migrated from one device to another. The National Museum of Australia's *Digital Preservation Policy* identifies the importance of ensuring that digital files remain 'authentic and traceable to the original via metadata stored with the digital copy' (National Museum of Australia 2009:6–7).

Format-shifting describes the process of 'copying content from one technological format to another' (Smartcopying 2011). Migration is the act of moving data between storage devices and storage systems. Every time a piece of information is reformatted or migrated there are risks. Format-shifting and migration are useful to avoid 'economic lock-in', whereby old formats require the maintenance of old forms of software and hardware. They avoid issues of exclusion and incompatibility over the longer term, for example, in having to pay for the upkeep of equipment that is out of date. However, new formats also present economic limitations when they are shifted to commercial software programs that may not be maintained over the longer term. Decisions about initial software formats should therefore include considerations of the ability to copy content across various formats over a long period, and the ability to upgrade to new formats or programs as required. Content produced with programs that are not freeware, or with freeware that is not supported over the longer term, is susceptible to changes in the commercial market, such as increased pricing, locking into later versions of software that may no longer deliver what is needed or may no longer be compatible with the hardware that supported the initial program, or simply the closure of the company that developed and delivered the software.

An 'interoperability framework' is often claimed as a method for avoiding the issues raised by software incompatibility (Australian Government 2006). This involves sharing infrastructure, streamlining systems across organisations and collaborating for delivery of content, but begs the question of what is useful at the local level where there may be, at best, one computer, an external hard drive, a memory stick and a packet of DVDs. Resources across communities are not the same, and while one community may be able to afford to be part of an interoperability framework, another simply may not have the human or financial resources.

One strategy to deal with the vagaries of software has been the development of data 'clustering'. This refers to a process of using more than one server to support a software application, thereby increasing 'all of the necessary capabilities for applications to achieve the maximum possible availability, reliability, scalability and performance' (Oracle 2011:1). By ensuring that an application is running on more than one server, any issue with one of the servers is automatically accommodated by the operations of other servers. Programs have been developed to allow an application 'to share, coordinate access to, update and receive modification events for critical runtime information across all of the redundant servers' (Oracle 2011:1). The success of clustering depends on continued organisational and infrastructure support, and requires a substantial organisational commitment. The fact is that few, if any, Indigenous organisations have the resources to deliver this type of support, which is perhaps best managed by peak or industry bodies.

Storage devices

Digital storage media such as computer hard drives, memory sticks, CDs and DVDs are physical objects, and therefore content stored in them is subject to the same kinds of impacts as any other physical record. Heat, moisture, physical damage and poor manufacturing standards, to name only a few, all affect the longevity and accessibility of the digital record.

Backing up data stored on hard disks using external drives, memory sticks and CDs or DVDs is thought by some people to be a preservation strategy. But these are not suitable for archival quality storage. In addition, some discs are more susceptible to environmental changes than others. ROM discs have an aluminium layer, which can corrode in adverse conditions. Recordable discs such as CD-R, DVD-R and DVD+R discs use gold, silver or a silver alloy for the reflective layer instead of aluminium. Gold provides the most secure layer, as it will not corrode, but is expensive. Silver is more reflective and cheaper than gold but is susceptible to corrosion. R discs use an organic dye-based layer for recording data. They cannot be erased by CD or DVD drives. However, the organic dye used in their data layer degrades over time. RW and RAM discs are generally not considered for long-term or archival use. Rewritable discs use a metal alloy film for recording data and aluminium for the reflective layer. The alloy film is not as stable as the dye used in R discs and normally degrades at a faster

rate, and the polycarbonate layer or the hard lacquer layer that coats the side with the label and along the edge of discs is also susceptible to damage. Assessment of various types of discs indicates that under recommended storage conditions CD-R, DVD-R and DVD+R discs should have a life expectancy of 100 to 200 years or more, whereas CD-RW, DVD-RW, DVD+RW and DVD-RAM discs only have a life expectancy of 25 years or more.[4] Anywhere from 20 to 100 years is predicted for CD-ROM and DVD-ROM discs, so the security of any data stored in these formats is uncertain. Rises in temperature of ten degrees Celsius will double the deterioration rate of the DVD and halve its life expectancy (Byers 2003).

Memory sticks and memory cards can be damaged physically, and memory sticks also have a limited number of times they can be used. The number of reuses is increasing with advancements in manufacturing, but these should not be used for preservation of important content. At present, the most successful back up is on an external hard drive stored in a different location to the main storage device, usually a computer, with hard copies kept of any important documents.

Risk management assessment and strategy

A risk management plan assists in identifying what content may be at risk and whether the risk is:

- an immediate impact, which is usually clearly evident immediately, and rapid responses may enable an appropriate remedial action
- long term, severe and ongoing, which is usually clearly evident as the damage is occurring with the opportunity to take remedial action
- long term, minor and incremental, which is usually not clearly evident until it becomes severe, and often when it is too late to undertake remedial action.

Most risk to digital material is long term, minor and incremental risk. Often, material in digital archives is not checked regularly and often not until it is required or when issues arise with the main data storage facility, which is usually the hard drive of a computer or a server.

In order to deal with these threats, it is necessary to consider where the vulnerabilities exist for digital records. Despite the fact that we think of the digital world as a virtual world, the reality is that all digitised and born-digital content is dependent on physical objects for its existence. The various methods for data preservation all rely on the capability of the system to retain and maintain content. Despite an emphasis on the virtual nature of digital record keeping, anyone who has woken up to find that their hard disk has crashed knows that even born-digital data is reliant on the vagaries of materiality.

The environment

The environmental impacts[5] on computers, hard drives, storage devices and discs may include:

- light
- temperature
- relative humidity
- pollution and contamination.

The quality of materials and method of manufacture are keys to how digital content storage media will survive. For example, oxygen is a highly reactive gas and is given off, in its most reactive form, from office printers and photocopiers. Oxygen and other pollutant gases will react with the aluminium layer on ROM discs, which corrodes, losing its reflective qualities and becoming dull. Circuitry in computer hard-drives can be similarly affected. In moist environments, oxygen and various airborne pollutants bond with the moisture in the air, and can migrate through the polycarbonate layer or the hard lacquer layer of a CD label side and edge, or affect metal in circuitry. One type of pollutant gas, sulphur dioxide, will react with moisture to form sulphuric acid. On a disc, penetration is easier through scratches, cracks or delaminated areas in the label. If discs are poorly manufactured, oxygen can be trapped inside the disc during manufacture. The life expectancy of a ROM disc or a hard-drive system therefore depends on the quality of its manufacturing and the environmental conditions to which it is exposed over time. As with most material, it is best to keep equipment and storage devices in a dry, cool environment away from light, heat, and moisture- and gas-producing equipment like kettles, photocopiers and printers. Writing on discs and cleaning them should also be done with caution as inks, solvents and pollutants have the potential to penetrate the disc surface creating deformations, discolouration and corrosion. Such damage causes permanent problems for laser readers (Byers 2003).

Prolonged exposure to ultraviolet (UV) light, with natural daylight being a potent source of this, can degrade the dye properties and eventually make the data unreadable. Leaving a disc on a desk that receives sunlight for even part of the day is therefore likely to jeopardise any data stored on the disc. Apart from the UV light and visible light, the build up of heat within the disc, as caused by sunlight or close proximity to heated light sources, will also accelerate dye degradation and affect delicate circuitry. Manufacturers claim that CD-R and DVD-R discs have a shelf life of five to ten years before recording, but no expiration dates are provided on the disc packaging, nor are there published reports of tests to verify these claims (Byers 2003).

The component parts in memory sticks and external hard drives should be protected in the same way as discs by avoiding high humidity, heat and pollutants;

ensuring that they are properly stored and handled; and, most importantly, not relying on them alone for backing up.

Disaster preparedness and response

The benefits and risks associated with travel on the information superhighway are complementary, but risks will increase as new forms of digital content capture and distribution are developed, such as the G3 and proposed 4G mobile phone networks (Table 1).

Table 1: Benefits and risks and remediation

Benefit	Risk	Remediation
Mobility	Loss and theft. It is easy to steal, lose or damage one computer, a mobile phone, a disc or a memory stick.	Security practices for hardware. Back-up copies held at distance from the main hardware.
Speed of data acquisition	Inability to manage accumulated data. It is easy to accumulate data without having the time to tag it or sort it adequately.	Establish metadata systems when filing systems are established. Be rigorous in timely and appropriate storage.
Large storage capacity	One event catastrophe. Large amounts of information in one, portable storage facility.	Clustering, back-up copies held at a number of locations.[6]
Ease of duplication	Leading to complacency about the need to check the condition of saved and stored records.	Regular assessments of both 'master' files and records, and copies. Ensure copies are updated when master records are format-shifted or upgraded.

In the digital world there are a number of actions that help manage risk. When creating content, identify the metadata and define the family of information this fits into. Is the file an office record or a social document, and how long will it need to be available? Some official records, like tax-related invoices, for example, have legislative requirements that govern how long they need to be retained. Thinking about how a record will be used when it is being created helps with naming and filing it. Proper filing requires a location pathway to enable ease of retrieval, facilitate recovery and identify other material that contextualises the information that has been created or stored. The National Archives of Australia (NAA) has a series of documents that can assist with record management and the principles are the same for hard copy as they are for digital records. The NAA website sections on 'Create, capture and describe', 'Keep, destroy or transfer', 'Secure and store' and 'Digital preservation planning'[7] provide useful information relating to the various requirements for digital content creation, maintenance, access and preservation.

When downloading content, check the condition of the hardware that holds the information, and whether it needs to be upgraded. Assess how old it is, and whether it is likely to be damaged through an inappropriate location such as sitting in a dusty or hot environment. Make sure there are suitable back-up strategies to preserve the information once it has been downloaded onto the main computer or storage device. Check the condition of the information on devices like computers, memory sticks, discs and mobile phones regularly to make sure it is in good condition, and whether it is stored in formats that will deteriorate. For example, make sure images are stored as tiff, rather than jpg, files.

Identify significant information that needs to be kept. For this kind of information, ensure that copies of the original record have been created and are used in preference to the original, and that archival copies have been made and are stored away from the original record. Information on disaster preparedness and response can be found on the Collections Australia Network (2005) website.

Preservation strategies and actions

In the United States the Northeast Document Conservation Center provides useful leaflets about preservation strategies and actions.[8] A strategy should include emphasis on making and managing content effectively, for developing work areas that ensure data is safe while it is being developed and used, ensuring that the materials used for content storage are suitable, providing the right environment for storing digital records, and being able to handle digital records safely.

Tips for good digital data collection management

Content development and management strategies

- Provide a manual that outlines the creation, data management and preservation policy for the organisation, and update this as part of the strategic plan and business planning process.
- Ensure software updates are provided for copies stored on other devices (for example, if archived copies are stored elsewhere on disc or hard drives).
- Produce a hard copy on archival-quality paper for any highly significant documents. This remains the most secure preservation method.
- Keep virus prevention software up to date.
- Back up in at least two locations and do not store the back-up disc in the same room (preferably not in the same building) as the main computer.
- Label the storage device so it is recognisable and can also be returned to you in event of loss (use a permanent non–solvent based marker — you can buy special pens that are suitable).

- Buy storage devices as you need them as their lifespan reduces from the time they are manufactured, not the time they are first used.
- The condition of a digital record is no different to any other record. To be useful it must contain the information that was present when it was created; this includes metadata and methods for tracking any changes that have been made to it.
- Be aware of new trends in digital preservation. This is probably best done by peak bodies, so the establishment of co-ordinated national preservation policies for Indigenous content remains an overriding concern.

Strategies for data-safe work areas

- Work in an area that is well organised with proper storage systems (boxes for discs, covers for memory sticks, external hard drives and computers). Cover items or put them away when not in use to ensure that dust does not affect them.
- Where there is a possibility that water can enter above the work and storage area, place a plastic cover over the items.
- Do not have computers near electric kettles, heaters or other heat- or moisture-producing equipment.
- Check and remove items that can cause disasters such as overloaded power points, and if possible ensure surge protectors are fitted to power supplies.
- Never leave computers on during an electrical storm.
- Ensure good ventilation with the use of fans or cross airflow. Maintain a stable temperature in areas where computer equipment and storage devices are kept.

Ensuring proper materials for storage

- In hot, humid environments use cloth covers rather than plastic.
- Do not use sticky labels or pressure sensitive tape for labelling directly onto a disc or other storage items. Most pressure sensitive adhesive will cross-link, become brittle and lose its grip with time.
- Do not label discs with spirit pens, particularly permanent markers.
- Ensure storage materials are chemically inert (do not use polyvinylchloride plastics; rather, use polyethylene).

Providing the right environment for storing digital records

- Avoid extremes of heat, cold and humidity.
- Avoid dusty and polluted areas for using computers and storing CDs, memory sticks and external hard drives (polluted areas include near equipment that gives off ozone, such as photocopiers and printers).
- Avoid magnetic fields, which can disrupt the operation of the disc. Do not place storage devices, including discs, memory sticks and external hard drives, close to television sets, video cassette recorders, DVD players, telephones and radios, and

do not store on or next to computers. For the same reason avoid vacuuming near storage devices.
- Avoid leaving storage devices in direct sunlight or enclosed spaces where the sun heats up the environment (cars, for example), and avoid exposure to high UV (fluorescent lights).
- Make sure that external discs and devices are ejected in accordance with instructions for safe removal.
- Unplug external devices when not in use to avoid power surges affecting them.
- Always store external devices in protective coverings and keep a cover on computers when they are not in use.
- A report prepared for the National Institute of Standards and Technology in the United States recommends temperature of less than 20 degrees Celsius and greater than 4 degrees Celsius and relative humidity of 20 percent to 50 percent for the storage of CDs and DVDs, with optimum conditions for long-term storage being 18 degrees Celsius and 40 percent relative humidity, and a lower temperature and humidity for extended-term storage (Byers 2003).
- Never store anything of value directly on the floor. Always raise the item (storage boxes, computers, for example) off the floor on blocks in case of flood (which can include air-conditioners leaking, toilets overflowing and other domestic catastrophes).

Safe handling of digital records

- Do not touch the surface of the discs and if they get dirty clean them with CD/DVD-cleaning detergent or solvents that are recommended by the manufacturer.
- When cleaning, wipe with a recommended cloth (soft clean cotton will do but make sure it is lint free) from the inside of the disc to the outside in a straight line, not in a circle around the disc.
- If dust is embedded in a memory stick, use a photographic puffer to clean it.
- Do not use sticky labels or pressure sensitive tape on discs.

Policy — limitations and failures

A survey of preservation policies relating to IT suggests two dominant themes. The first is an interest in the economic benefits of IT, and the second is an interest in issues of equity and enablement that is provided by access to the internet. These themes are underwritten by statements about the need to balance inequalities in current IT resourcing and to build future capacity.[9] However, there is little mention of the complexities of ensuring intergenerational retention or the longevity of this information. The NAA digital recording guidelines, developed in 2004, provide useful information, but they are aimed at Australian Government agencies (National Archives of Australia 2004). Digital Preservation Europe's *European Quarterly Preservation*

Digest identifies a number of preservation programs, including Digital Repository Audit Method Based on Risk Assessment (DRAMBORA), Sustaining Access through Multivalent Heritage Archiving (SHAMAN), Cultural, Artistic and Scientific Knowledge for Preservation, Access and Retrieval (CASPAR), Preservation and Access through Networked Services (Planets) and the Living Web Archives (LiWA).[10]

The point is often made in policy documents that the digital world is an enabler in the way that more traditional information pathways are not. Software packages that link to mobile phones for at-distance health assessment are only one example of the ways in which the internet supports new types of access. For records of any significance, however, access is not just about immediacy, but must also be about longevity.

Using a term like access requires some explanation according to Kevin Bradley (2007:154–5), who notes that:

> It is not only about the ability to find and retrieve an item, but also the ability to use, view, listen to, interact with, display, or run the digital item in such a way that users can be assured that what they are viewing satisfies their needs. This may, for example, be a requirement to see exactly what the creator originally intended, the identical look and feel, or it may be the ability to find and interrogate the same data, or simply to be able to read the same text.

The question is how individuals and communities can ensure that what they create now can be preserved for those for whom it may have value in the future. The future can mean tomorrow, five years, 25 years or five generations (Woodyard 2000). How do we ensure that what was intended by the original creator is preserved?

E-inclusion and inbuilt inequality

Dealing with inequalities in resourcing is clearly one issue. On the information superhighway the pace is so fast that keeping up with technological developments requires consistently high levels of investment, both intellectually and financially, not to mention issues relating to skill development. For a worker in an art centre in a remote Aboriginal community, the time needed to develop IT skills that will enable an understanding of latest software and hardware operability, and to ensure that relevant archive practices are being followed, may simply not be available. There is also little point in building complex data capture, storage and retrieval systems if those using them cannot understand them, or do not have access to the relevant infrastructure or training. E-inclusion is not simply a matter of enabling access. For some records that contain content of value to Indigenous peoples, inappropriate access can be more problematic than no access (Wright and Wadhwa 2009). Ensuring appropriate access to archives over the longer term is also an issue.

If communities and individuals do not have the capacity to save their records, then in the longer term the information that relates to them will be patchy and, as a result, lack the significance of more coherent, properly contextualised data. The result is that the preservation of much of Australia's digital record is, at best, a fragmented activity and, at worst, may become a disaster that will wipe large sections of the record of the late twentieth and early twenty-first centuries from existence. The concern is that what will be missing will reflect current social inequalities, and will be determined by gender, age, economics, geographical location and access to training.

Future directions

A final concern relates to material that is held in language centres, keeping places and art centres. Much of this material has not been digitised, and has not even been properly catalogued or recorded. Managing this is simply beyond the resources of small, remote, under-resourced communities. In this respect, large amounts of material that have recently been generated, or are currently being developed, in Indigenous communities are currently under threat. E-exclusion is engendered by both socio-economic and demographic variables that include gender, language and age, as well as purchasing power and geographic location. There is little point in building complex data storage and retrieval systems if large sections of the population do not have access to the relevant infrastructure or training. Most importantly, there is a real danger that vast amounts of Australia's digital heritage will be lost within five to ten years, when obsolescence, incompatible formats, natural disasters and poor housekeeping render this material inaccessible.

National co-ordination is required to ensure that important content held locally is identified, digitised and backed up safely. Developing best practice in record management and digitisation for Aboriginal communities requires support in policy, strategy, training and infrastructure provision. This is a job for governments at all levels, professionals with necessary skills, training providers and custodians to work together to ensure collaboration and co-operation between national and state collecting organisations in Australia. Issues of copyright and intellectual property need to be understood and assessed. Protocols need to be developed at the community level, and then integrated into institutional and government programs. This will involve the incorporation of the rights of Indigenous Australians into the development of a national model. As Bradley (2007:158) notes, '[d]igital preservation, if it is to be sustainable, is an economic issue, one that advocates investment in the present to ensure access in the future.' Bradley (2007:159) goes on to state that:

> The requirements of ongoing sustainability demand a source of reliable funding, necessary to ensure that the constant, albeit potentially low-level support for the sustainability of the digital content — and its supporting repositories, technologies,

and systems — can be maintained for as long as necessary. It is not too strong to say the biggest single risk to sustained access to digital information is economic.

The tragedy is that, in many Indigenous communities, content is being created today in the belief that this information and knowledge will be available for future generations, but without proper archive and preservation strategies this may not be the case.

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Notes

1. For a discussion of digital preservation, see Digital Preservation Europe (http://www.digitalpreservationeurope.eu/).
2. For a more comprehensive list see National Archives of Australia 2004:13–14.
3. Available at <www.ifla.org/>.
4. An accelerated aging study at the National Institute of Standards and Technology estimated the life expectancy of one type of DVD-R for authoring disc to be 30 years if stored at 25 degrees Celsius (77 degrees Fahrenheit) and 50 percent relative humidity. For further details see Chapter 4 in Byers 2003.
5. See the *reCollections: Caring for collections across Australia* documents (available on the Collections Australia Network website at <www.collectionsaustralia.net/sector_info_item/3>) for information about the best environmental conditions for the care of materials.
6. On clustering see Oracle 2011.
7. Available via the 'Managing your agency records' page of the NAA website at <www.naa.gov.au/records-management/agency/index.aspx>.
8. See the 'Resources: Preservation leaflets' page of the Northeast Document Conservation Center website at <www.nedcc.org/resources/leaflets.list.php> for useful links.
9. See Department of Finance and Administration 2006. Also see Australian Government 2010.

10. See the program websites at DRAMBORA, <www.repositoryaudit.eu/>; SHAMAN, <http://shaman-ip.eu/shaman/>; CASPAR, <www.casparpreserves.eu/>; Planets, <www.planets-project.eu/>; LiWA, <www.liwa-project.eu/>.

Chapter 16

Building the National Recording Project for Indigenous Performance in Australia: Five years on…

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The National Recording Project for Indigenous Performance in Australia (NRP) was conceived in 2002 and launched at the Garma Festival in north-east Arnhem Land in August 2004. The primary motivations behind the NRP were as much philosophical as they were pragmatic. First, those of us who envisioned the potential usefulness of such an initiative — namely, Allan Marett, Dr Yunupiŋu, Marcia Langton, Joseph Gumbula, Linda Barwick and myself — were dissatisfied at the way that Indigenous communities were rarely able to access, within their own localities, the decades of recorded materials held in collections worldwide that documented their cultural heritage. So to encourage collectors to make their recordings immediately available to their source communities, rather than stockpiling them in shoeboxes under their desks as in many instances in decades past, we have since fostered a national network of interested people from academic, technical and Indigenous community backgrounds through the NRP, which is working collaboratively towards this end.

Fundamentally, the NRP aims to develop a national digital repository through which all Indigenous communities in Australia will be able to store and access any existing and future recordings of their music and dance heritage from within their own home towns. Second, we seek to achieve this aim by sustaining a collegial network through which leading Indigenous cultural exponents such as Joseph Gumbula, Payi-Linda Ford, David Manmurulu and Steven Jampijinpa Patrick can share information and shape new strategies for content delivery with recognised world leaders in the field of digital archiving and sustainable repositories, like Grace Koch from AIATSIS, Kevin Bradley from the National Library of Australia, Cathy Hilder from the Northern Territory Library (NTL) and Linda Barwick, who directs the Pacific and Regional Archive for Digital Sources in Endangered Cultures (PARADISEC).

With the exception of Barwick, each of these experts sits on the NRP Steering Committee. This approach has ensured that all directions taken through the NRP are informed by Indigenous community needs, as well as best-practice technical considerations for developing digital repositories that are archivally sound, open source, upwardly and downwardly compatible, and sustainable into the future. On this front, I reiterate that *.mp3 is not an archival medium for recording digital sound. This is a lossy compressed file format often used by journalists for its small size and expendability. Recording sound for archival purposes should instead be done in uncompressed *.wav at the highest practicable quality (PARADISEC 2007). Magnetic tape, of course, including cassette and digital audio tape (DAT), is completely obsolete and, even now, only bodies like AIATSIS, the National Library of Australia and PARADISEC, which are in the business of maintaining old working machines in these formats, will be able to digitise them.

The NRP's fundamental approach has its roots in the inaugural Symposium on Indigenous Music and Dance, which was convened with funding from AIATSIS by Allan Marett, Dr Yunupiŋu and Marcia Langton at the 2002 Garma Festival in north-east Arnhem Land. Here, at this meeting, Indigenous stakeholders and their colleagues from universities and collecting institutions in Australia and Papua New Guinea explored what contemporary Indigenous communities need from audio-visual archives. We also sang and danced together, collaboratively translated song lyrics from recordings of traditional repertoire, and discussed the transposition of Indigenous protocols for managing access to cultural property into the architecture of digital archives. We did as little conventional academic presentation as possible, and through this process found common ground that enabled us as a group to agree on the central goals published in the *Garma Statement on Indigenous Music and Dance* (NRP 2002). They were:

1. That the establishment of Indigenous Knowledge Centres with digital storage and retrieval systems be supported as a basis for the repatriation of sound and visual records to communities…
2. That a National Recording Project for Indigenous Performance in Australia be established to ensure that the songs of as many singers as possible are held for future generations…
3. That the recording and repatriation of songs to local Indigenous Knowledge Centres be supported by universities and other institutions to assist Indigenous communities to integrate their cultural knowledge to a broad range of community activities such as education, bilingual and health programs, and that the performance of ceremony be encouraged through its incorporation into community governance.

4. That well documented recordings of Indigenous song be published in order to educate the broader Australian public and international audiences about Aboriginal performance traditions…

Indigenous leadership in the formulation and governance of the NRP from across a broad range of interested communities remains a guiding principle that spans each of these goals, as does the desire to promote as broadly as possible the status of Indigenous music and dance traditions as an invaluable and irreplaceable foundation of Australia's cultural heritage (Marett et al. 2008).

Ultimately, the Garma statement called 'on the Australian Government to support and sustain Indigenous performance traditions through the establishment of Indigenous Knowledge Centres, and a National Recording Project for Indigenous Performance in Australia as a National Research Priority' (NRP 2002). The symposium's delegates further resolved 'to pursue funding from the Australian Research Council, and government and industry sectors…[and] to request that governments, universities, industry and philanthropy acknowledge and respond to this urgent need' (NRP 2002).

While the Australian Government has not yet recognised this specific field of endeavour as a National Research Priority, there are nonetheless two priority goals under the 'Frontier Technologies for Building and Transforming Australian Industries' National Research Priority that are closely aligned with the NRP's aim to develop a national digital repository through which scattered Indigenous communities can locally access audio-visual records of their cultural heritage. They are the priority goals for 'Smart information use' and 'Promoting an innovation culture and economy' (Australian Government 2008). The Australian Research Council (ARC) has acted to formalise this alignment by introducing 'the advancement of knowledge into Indigenous Australian societies' as a research priority of its own (Australian Government 2009:14).

Since the launch of the NRP in 2004, numerous associated projects have been awarded funding by national granting bodies such as ARC and AIATSIS (NRP 2007). So far, these funds have supported recording and research into endangered music, dance and related language traditions from many discrete cultural regions within Australia, including Roper River, north-east Arnhem Land, western Arnhem Land, the Tiwi Islands, Daly River, Victoria River, the Kimberley, the Pilbara and Central Australia. Recent inroads have also been made into establishing new working relationships with Indigenous tradition holders in southerly regions such as the Hunter Valley in New South Wales. Also influential was NTL's receipt of an Access to Learning Award from the Bill & Melinda Gates Foundation in 2007, which went towards the development of Indigenous Knowledge Centres in towns throughout the Northern Territory. These projects have fostered significant, new collaborations across the fields of Indigenous studies, ethnomusicology, linguistics, anthropology, history, curatorial studies, and

information and communication technology. In this sense, the NRP functions as an expansive, longitudinal meta-project through which new projects, each with their own unique avenues of investigation, research collaborations and regional focuses, can build on past work.

As exemplified by Joseph Gumbula's work in the fields of curatorial studies and ethnomusicology (Gumbula 2005, (cur.) 2009–10; Corn and Gumbula 2006, 2007; Gumbula et al. 2009), the NRP is also contributing significantly to building the research networks and capacities of Indigenous tradition holders. Since 2007, Gumbula's research into collections that document the history and culture of his people, the Yolŋu of north-east Arnhem Land, has been supported by two substantial ARC Fellowships for Indigenous Researchers' Development held at the University of Sydney. Pursuing similar opportunities for other such Indigenous investigators remains a high priority for the NRP, as does the training of emerging Indigenous talents who are interested in learning how to effectively record, document and archive their own music and dance traditions within their own communities.

Since its inception in 2002, the NRP's overall focus has been maintained through the annual Symposium on Indigenous Music and Dance, which moved from the Garma Festival in Arnhem Land to Charles Darwin University in Darwin in 2007. This meeting attracts broad representation from scholars in related fields, major collecting institutions and Indigenous communities alike. Indigenous representation from a broad array of different regional and cultural backgrounds within Australia is high, and in years past international performance groups such as the Bauls of Bengal and Takbing Siwaliya from Sulawesi have also participated. Presentations at these meetings often produce dynamic intercultural and intermedia dialogues among performers and scholars that reveal the centrality of performance traditions within Indigenous epistemologies. Under the guidance of traditional exponents, live performances of rare song and dance repertoires often bloom into profound discussions of their sacred resonances with kin, country and ancestors, while otherwise conventional analytical papers can similarly erupt into responsive live performances by Indigenous delegates. Intercultural and intermedia dialogues of this kind have ensured that the NRP remains engaged with and responsive to the epistemological bases of Indigenous community standards, needs and concerns for any work involving these most valuable cultural resources.

The fruits of such dialogues are exemplified in my work with Gumbula to record and document one of his own family's song series of the Yolŋu Manikay tradition for the forested homeland of Baripuy in north-east Arnhem Land. This research was largely driven by Gumbula's desire to make recordings of this repertoire locally available for future generations, and relied heavily on his consummate knowledge, as an experienced ceremonial leader, of its place within Yolŋu law.

Earlier this century, anthropologist Peter Toner (2004) undertook an ARC project to return decades of earlier recordings from Yolŋu communities. As a consequence,

Gumbula found that in the early 1960s the ethnomusicologist Alice Moyle had recorded his father, Djäwa, and father's brother, Boŋawuy, singing a small selection of items from the Baripuy song series (Moyle (ed.) 1967:4A, tracks 1–2). But with this discovery he also realised that no complete sound recording of this repertoire in its entirety yet existed (Gumbula and De Largy Healy 2004).

In 2004 and 2005 I was therefore enlisted by Gumbula's family to travel with them to Yolŋu homeland, Djiliwirri, with the aims of making a complete digital recording of the Baripuy song series as sung by Gumbula and his brothers, and of capturing stories, photographs, film and geo-data for related sites within this country. Unlike a conventional ethnographic exercise in which the researcher passively records whatever might be happening within the source community during the time of her or his visit, our approach at Djiliwirri constituted a deliberate attempt by Yolŋu leaders to perform and contextualise one of their own previously undocumented repertoires for the archival record.

As Gumbula and I have noted in a volume of articles on NRP projects for AIATSIS (e.g. Corn and Gumbula 2007), one of our key concerns in undertaking this task was to ask how we would know if we had indeed succeeded in making a complete recording of this particular song series, and whether it one day might be useful to a grandchild of the musicians as an illustrative guide to its performance. Much of the aural complexity in the Manikay tradition lies in its heterophony. Multiple singers typically sing the same melody in parallel, yet each in their own individuated way, to create the illusion of one voice made of many. Even word order and repetition within a song item's lyrics will vary among different singers on different occasions. As a consequence, no two iterations of any given song item will ever be exactly the same, making it hard to know what might constitute a representative recording. Multiple recordings of a breadth of different musicians who perform the same repertoire are therefore preferred. There are also parts of the Manikay repertoire that cannot be captured by recording musicians in isolation from dancers. For example, when dancing to Manikay, men typically perform a simultaneous antiphonal call-and-response vocal part that interlocks with the rhythmical structure of each song item. This material is absent from our Djiliwirri recordings of the Baripuy song series, yet could be incorporated by using a sound studio to overlay these parts on additional tracks in the future.

Gumbula and I have now fully translated this series, and our recordings from Djiliwirri are scheduled to be released as an album for the new NRP series, The Indigenous Music of Australia. This new series of musical albums and books builds on Allan Marett and Linda Barwick's long experience in recording and documenting a broad array of Australia's endangered Indigenous traditions in collaboration with leading performers and scholars (Cooper et al. 2005; Lane 2001; Maralung 1993; Marett 2005; Martin 2003; Papulu Apparr-kari Language and Culture Centre 2000, 2004). The first album of the new NRP series features songs composed by Kevin

Djimarr (2007) in the Kun-borrk tradition of western Arnhem Land, while our first book presents my own research into the centrality of the Manikay tradition to the music of the north-east Arnhem Land popular band Yothu Yindi (Corn 2009).

Since 2005 I have worked with a much broader cohort of Yolŋu elders to capture several other Manikay series, and hold standing invitations to record, document and archive yet more. The transformation of recording media from wax cylinder to solid state hard drives within the span of a century has unquestionably revolutionised our ability to capture and return high-quality sound recordings to Indigenous communities with unprecedented ease and rapidity. Yet there are nonetheless serious budgetary and infrastructural constraints upon the NRP that need to be resolved before all standing calls from Indigenous communities for local recording and archiving initiatives can be met (Corn 2007). Training in digital recording and archiving technologies needs to be undertaken to empower Indigenous communities as collectors and curators of their own cultural records. A formal agreement needs to made and implemented with a body such as AIATSIS to centrally store and tag the NRP's growing collection of data and metadata, and then server, networking and secure interface infrastructure need to be developed so that local communities can remotely access these cultural resources instantaneously.

Marett and Barwick's collaborative work with NTL to establish digital sound archives in remote Indigenous communities such as Belyuen and Wadeye also shows that computer terminals and hard drives cannot simply be loaded with content by an external agency as a one-off exercise and then forgotten. Over time, hardware fails and software corrupts, and without sufficient funds for maintenance, upgrades and replacement, even modest facilities such as these will inevitably fail (Marett with Barwick and Corn 2008). These needs must nonetheless be met. All too often has a bushfire or some other disaster swept through a remote Indigenous community destroying the local broadcasting facility and, along with it, three decades of unreplaceable audio-visual materials documenting everything from football matches to rare traditional ceremonies. Not to equip Indigenous communities with the best digital technologies now available to protect such invaluable cultural resources is completely unconscionable.

The recent introduction to remote Indigenous communities of digital devices as ubiquitous as iPods, digital cameras and mobile phones has irrevocably stimulated community leaders to consider what they themselves can do to ensure that their traditional knowledge and practices are recorded and accessible to future generations. There are also far more immediate benefits to be had by Indigenous communities through the process of recording performance traditions on remote homelands like Djiliwirri. In essence, all kinds of recording and archiving around local performance traditions can spark all kinds of community interest and action in them. Indigenous community investment in such recording, documentation and archiving processes therefore not only creates lasting records of Indigenous performance traditions, but

can also spark catalytic community-wide engagements with tradition as a whole. This is perhaps the ultimate goal of the NRP: to produce enduring records of lived cultural experiences that will follow Indigenous tradition holders throughout their lives, and will always be readily available to them as they strive to pass their invaluable heritage from generation to generation.

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