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ABORIGINAL KNOWLEDGE TRADITIONS in DIGITAL ENVIRONMENTS

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■ Abstract

According to Manovich (2001), the database and the narrative are natural enemies, each competing for the same territory of human culture. Aboriginal knowledge traditions depend upon narrative through storytelling and other shared performances. The database objectifies and commodifies distillations of such performances and absorbs them into data structures according to a priori assumptions of metadata; that is the data which describes the data to aid a search. In a conventional library for example, the metadata which helps you find a book may be title, author or topic. It is misleading and dangerous to say that these databases contain knowledge, because we lose sight of the embedded, situated, collaborative and performative nature of knowledge. For the assemblages of digital artefacts we find in an archive or database to be useful in the intergenerational transmission of living knowledge traditions, we need to rethink knowledge as performance and data as artefacts of prior knowledge production episodes. Through the metaphors of environment and journey we can explore ways to refigure the archive as a digital environment available as a resource to support the work of active, creative and collaborative knowledge production.

■ Introduction: Emerging Aboriginal digital environments

Digital technologies are already changing the lives of Aboriginal Australians in remote areas. Kids are using them for games and music, adults for banking and shopping, there are now more DVD players than video machines, computers are found in schools and resource centres, digital and still cameras are at work producing and disseminating records of ceremonial events. Wherever Aboriginal people have their own computers they produce and make use of their own digital objects. The use of recording technologies is not new. Twenty years ago, visiting a remote Aboriginal community like Milingimbi, one could find people operating upon audio cassette tapes, pulling them apart, winding and splicing tapes, replacing lost foam support with cigarette filters and exchanging recordings of ancestral song. With the new generation of digital recording technologies, we continue to find people exploring video and audio recording for their own political, social and religious purposes, as well as repatriating and talking about old recordings of ancestral song, old photographs, and old movies of ceremonies which have been converted to digital video. Our research (Scott, 2004, p. 4) showed that there are 38 databases of "Aboriginal knowledge" in the Northern Territory. Of these "only 2 organisations ... said they had clear policies on returning data to the Aboriginal owners" (Scott, 2004, p. 4). In other states and internationally, many institutions, especially the older ones, are often reluctant to repatriate.

My colleagues Helen Verran from the University of Melbourne, and Waymamba Gaykamangu from Charles Darwin University and I in our Australian Research Council (ARC) research project (see <http://www.cdu.edu.au/ik>) on digital technologies and the intergenerational transmission of traditional ecological knowledge, have, for example, found and assisted Aboriginal people making video recordings of ceremonies quite specifically for the purposes of showing them to absent ceremonial leaders for surveillance purposes, a new way of making sure that things are done properly by the right people. Long before computers arrived at their communities, audio cassette tapes were already part of traditional Aboriginal regimes of knowledge production, dispersal and concealment. People continue to carry in their

sacred dilly bags audio cassette recordings of secret/sacred stories which detail the ancestral connections between individuals, place and groups from which their spirituality, their rights and their responsibilities derive. The use of digital video extends an established practice of recording performances for such political and religious purposes.

Meanwhile, government and non-government departments are capitalising on the growing Aboriginal familiarity and interest in digital technologies to set up or deliver databases for/of "Aboriginal knowledge" for community purposes. Examples include Knowledge Centres, and Land and Sea Management organisations. In its most frequent and alienating manifestation, this work involves the wholesale downloading of archived digital content into data structures and search/display machines for delivery to Aboriginal communities. In our observations we have found very little evidence that Aboriginal users/owners are actively involved in conceptualising the possible purposes or uses of this material, in collaborating in the selection of resources, or the database design, or in the actual database use for education or recreation. We question the usefulness of such archives for the intergenerational transmission of traditional practices of knowledge production.

Yet we are working with people who clearly see the potential of resources repatriated from official archives for their individual and collective work of keeping knowledge strong. Joe Neparrnga, for example, manager of the Galiwin'ku Knowledge Centre, made clear to us that in the collection of photographs and artefacts collected by Donald Thomson from Yolngu country in Arnhem Land in the 1930s and 1940s, he sees the possibility of "filling the gap" which appeared in the continuity of religious life in the period of intensive missionary activity immediately following World War II. In another example, Bryce King, a research assistant with the Australian Research Council project, recalls in Vanuatu, a couple of older men who came into the cultural centre specifically to view a video of a ceremony which had been recorded some years earlier. They couldn't agree on some particulars of a relevant headdress for the ceremony which was about to be performed again, and had come to settle the question in the cultural centre by reference to the old film. How does the existence of such an archive change knowledge-power relations in the community and the work of adapting knowledge practices to changing conditions?

This paper addresses three questions – one ontological, one epistemological, and one strategic. How might we best understand the nature of the digital environment and the objects it contains in both the database and in the Aboriginal world of knowledge production and reproduction? How might we best understand the assemblage of digital objects in the work of collective memory-making which is fundamental to renewing traditional knowledge in each new generation?

And how might we design and evaluate digital resource management systems to be congruent with and supportive of Aboriginal knowledge traditions?

■ The official archive and Aboriginal knowledge

Our project began with an unexamined impulse to repatriate the contents of official archives of "Aboriginal knowledge" for use by the original owners and their descendents. Interested in the first instance, in "ecological" knowledge we had/have in mind such collections as the ethnobotanical collection in the Darwin Herbarium, but also (later) for example the previously mentioned collections of old photographs and other objects taken by Donald Thomson and now stored in the Museum of Victoria, or the archive of Aboriginal place names owned by hundreds of different Aboriginal groups with their corresponding scientific locators (e.g., latitudes and longitudes) which have over the years been collected and archived by organisations such as the Northern Land Council and the Aboriginal Areas Protection Authority.

Our research wherever possible began in various contexts with what people are already doing on the ground. This had the effect of generally broadening the definition of ecological knowledge to be not so much knowledge of the environment (although it certainly includes that) but more in the original sense of *ecologic*; that is, of the relations between people and their institutions and the environment. While traditional Aboriginal religion has always been precisely about this "home-discourse" (*oikos-logos*), the archive which we might take to be quite friendly to the support of Indigenous knowledge traditions, we find in fact to be rather intractable. We use the term knowledge "traditions" rather than knowledge "systems" to emphasise the ways in which human communities "do" their knowledge, giving across generations and to other knowledge communities.

There is much stripping and splicing to be done to fit Aboriginal representations of ecological knowledge into an official archive. The very features which provide its main significance in an Aboriginal knowledge tradition (where this particular plant happens to be for these particular people at this particular point in their lives, who is telling the story, why they are telling it here and now, and how the story fits into the wider networks of kinship, art, music, ceremonials and philosophy) are lost in the process of abstraction which records how any plant of this particular species in any location might be of use to any person at any time (as a foodstuff, or medicine for example). Stripped of its provenance, and moulded as a fact, the datum is then inserted as a node in a logical complex. It takes on its new meaning, in fact, precisely by virtue of its relation to all the other elements within the data structure.

Within the Western scientific tradition, the ontologies institutionalised at a very concrete level

within information infrastructures have a normalising and particularising effect on what it is possible to remember (and thus to know). While the ideal databases are generally understood to be theory-neutral, the ontologies they produce and perpetuate actually influence the social practice of techno-science in the West, and now in Indigenous contexts (Christie, 2005). For example, "grooving" is a process whereby the data infrastructures of databases gradually affect the way in which we understand the world. Some things in the world are a lot easier to identify or define than others, they make their way without difficulty into databases, and thereby become constitutive of the theory of reality through which we think. Other things, however, that may be harder to define, or are contested or have fuzzy boundaries, or are radically singular (in that they are unlike anything else), will fall through the cracks. Then there is the practical embodied "how-to" knowledge, and the knowledge which cannot be put into words upon which intuition depends. They simply fail to make it into the database because they cannot be absorbed into its structure. After a while, we develop a represented world within our database, which takes on a particular structure or regularity not so much as a reflection of the reality of the world itself, but much more a function of the data structures – the "grooves" – that we have chosen to depend upon in the first place (Bowker, 2000).

Bowker and Star (1999) go further, to identify a subsequent process – "reverse bootstrapping" – where we start to make assumptions about the nature of the world on the basis of the structures of the data that we are accessing in our database. In research areas, such as biodiversity and language diversity, fundamental (and often unconscious) assumptions about the nature of reality (e.g., the ontological status of an ecosystem or species or language) will inevitably become "hard wired" into the architecture. Their databases go on reflexively to affect the way in which the researchers understand and reinvent the world outside. In the case of Aboriginal knowledge, some things which are perceived to be more charismatic than others, (crocodiles as opposed to algal blooms, for example, both of which are totemically significant in the Yolngu world), find their way into the database, whereas other things, that are equally important in terms of Aboriginal knowledge don't make it (Christie, 2005).

As knowledges of many peoples, many places, many species are collocated, the archive emerges as a political project not simply an epistemological one. This is true also of cultural archives like the Donald Thomson collection or the "Territory Images" collection of old photographs held in the State Library in Darwin. Archives are mandated to collect and preserve representations identified as having a certain cultural value. As social institutions, they depersonalise the judgments of value that they make, rendering them both public and normative. They purport to retain

objective value and to serve as legitimate celebrants of items of indubitable (if not universally acknowledged) merit. This is so despite the fact that many archives (like the Thomson collection) are composed entirely of the collections assembled by a single individual.

Worse, we now understand the ways in which the original imperial collectors (e.g., Foelsche's photographs of Aborigines in the Darwin area, or Edward Curtis' photographs of Native Americans in the same era) dressed their subjects up with paraphernalia they had collected from other peoples in other places. Imperial archives seem everywhere to be more or less infected by colonialist fantasies. Even in more contemporary less tainted official archives, the resources they contain (and the archives themselves) increasingly relate to each other in ways which render absent the original knowers and owners. They produce a naturalised and homogenised ethnobotany, for example, as an unreflexive body of knowledge which exists outside of both the specific historic moments of its production, and the many and varied relationships between the scientists and the Aborigines and the contexts of their interactions (McConaghy, 2000, pp. 26-27). This process silences the discordant and independent voices of those recorded, and should be understood as much as sites of multiple expulsions as of liberation (Cowlshaw, 1992; Muecke, 1992). The exclusions at work here are congruent with the wider project of Western science which values knowledge to the very extent that it is divorced from the object of its manifestations. McConaghy (2000, p. 86) writes:

Science is about the creation of models and abstractions of the real world, and it is this process of abstraction that is a significant aspect of science's social value ... It is the language which is most abstracted from the concrete world, that is the language which creates greatest distance between the utterance, the concept and the thing, that tends to be invested with most social value.

Today we find ourselves in a situation where archives are proliferating. Derrida's (1996) archive fever is pandemic. Institutions who own archives are increasingly keen for their contents to be repatriated to their owners, and there is a growing advocacy on the part of both Black and White for the repatriation, refiguring and reinvestment of the archive as a solution to the problem of a new generation of Aboriginal youngsters distracted and apparently uninterested in their ancestral lore.



Digital resources and Aboriginal collective memory-making

How then do we begin the work of refiguring the archive for Aboriginal purposes? It would be hard to

imagine two knowledge regimes more different than an Aboriginal extended family performing and renewing its knowledge collectively in the routine practices of day-to-day life, and a Western scientist collecting data for a biodiversity database. Yet the past few years in the Northern Territory have seen many attempts to bridge that gap. The work of Helen Verran (2002) gives a detailed account of such an interaction in the context of landscape burning and the work of doing sameness and difference together. Our challenge is to find ways in which Aboriginal digitising technologies (Aboriginal cameras, Aboriginal computers, Aboriginal databases, repatriated archives), and those digital resources generated through Western techno-scientific practice (abstraction, commodification, objectification) can be of use to Aboriginal knowledge traditions as they are reproduced in new generations. We have already noted the burgeoning use of digital technologies in Aboriginal communities. What happens when they interface with the archive? Can we reinterpret its digital content?

The Western tradition commodifies its knowledge into an economy of facts. A fact is a commodity which can be bought, sold or exchanged. A fact is objective; that is, it is true anywhere and always, and not dependent upon who is telling the story. Facts sit easily within the database structure because they bear natural relations to each other and those relations can be structured. But in an Aboriginal knowledge tradition, the emphasis is on ways of producing, prosecuting and assessing situated and timely truth claims. We are therefore faced with the difficult initial task of unthinking the archive as a repository of knowledge (rather than, for example, as a repository of representations of, or claims of knowledge stripped of their historical and geographical provenance) and rethinking of it as a memory resource containing assemblages of traces of previous truth-claim episodes.

This unthinking-rethinking process is critical, because it refocuses us upon a fundamental tension between scientific and Aboriginal metaphysics which accounts for this fetish of the fact, so strange to Aboriginal knowledge traditions: Western scientists (and to a great or lesser extent all of us) perceive a fundamental split between language/sociality/culture on one hand, and the natural world out there on the other. This split reveals the function of language in the Western knowledge tradition to be one of representation. Language *represents* the world. Generating increasingly accurate representations of the world is the work of science. Aboriginal traditions on the other hand claim no such split between language and materiality. Graham suggests, "There is no division between the observing mind and anything else: there is no 'external world' to inhabit" (1999, p. 113). Talking, singing, crying, dancing, and painting all actively participate in the creation of new worlds as they have always done since the ancestors first talked, sang and danced the world into existence.

Similarly, of course, places generate language as language generates place. Early in our research we were working with Yingiya Guyula from Milingimbi. While keenly interested in the potential of digital technology for keeping his religious-political knowledge strong into the next generation, he was quite diffident about the potentials of a conventional digital database. He was insistent that the land was his database, and described in detail as he paced around the floor, how each place spoke of the ancestral acts which gave it its forms and resources. His main concern was that people were forgetting the more subtle distinctions between named groups of related Yolngu belonging to specific territories who shared ancestral totems. He could see these confusions in ceremonial practices, and watching them he felt "torn apart". The land as database tells you who you are, where you have come from and how you must behave. Confused or sloppy performances in ceremony are of course not the only sign of failing memory, but Yingiya, like most other Yolngu exegetes, use the metaphors of ceremonial performance to elaborate the case of ancestral knowledge traditions *par excellence* (see also Christie, 2000; Marika-Mununggiritj, 1990; Marika-Mununggiritj et al., 1990).

Knowledge production is social, negotiated work which depends upon collective memory practices in both Western science and Aboriginal ecology. As Bowker (2005) points out, there are two sides to this memory story – the social and political work of creating an explicit indexical memory for science and knowledge (the database, the knowing land, song, art), and the ways in which people reconfigure, lose and regain their pasts (storytelling, painting, cultural and religious performance, institutions and their discontents). Cameras, computers and codings become just another part of the assemblage of technologies at work producing and reproducing collective memory.

So we are searching for ways in which these digital environments and the refigured, reconceptualised resources retrieved from archive, may be developed to enhance the ancient and ongoing Aboriginal work of renewing ecological knowledge in successive generations of young people.



Developing digital systems for invigorating Aboriginal knowledge traditions

Everywhere in the Aboriginal world we see knowledge and truth claims performed as narrative. Ceremonies – the truth claim *par excellence* – are refigurings of ancestral events to reflect current contexts. Responding to issues in the context of collaborative research, Aboriginal people often provide narrative. The datum is irrelevant. The database, as Manovich points out in his study of the database as a symbolic form,

represents the world as a list of items and it refuses to order this list. In contrast, a narrative

creates a cause-and-effect trajectory of seemingly unordered items (events). Therefore, database and narrative are natural enemies. Competing for the same territory of human culture, each claims an exclusive right to make meaning out of the world (Manovich, 2001, p. 225).

The database has two features which produce this enmity. The first is the sequestration of metadata into predetermined fields which enforces a particular a priori ontology inhibiting and in fact precluding the creative work of making new worlds, new possibilities, through the creative, connecting work of language. We can identify the ontology of data infrastructures (in the work of computer scientists) with the ontology of an Aboriginal knowledge tradition (in the work of philosophers such as Helen Verran) and try to find ways to make the database ontology accommodate the Aboriginal ontology. We have two choices here. One is to try to hard wire the complex possibilities of Aboriginal connectedness into the metadata structures as was attempted for example at the Galiwin'ku Knowledge Centre. There, the programmers developed a "42 level relational database to catch the way Yolngu people think about the natural world" (The *Australian*, June 10, 2003, p. 29). This is of course impossible to achieve and in fact unnecessary to attempt. In the Yolngu world, a word (or phrase) can be a person, a place, the name of a ceremony or object or song, an act, a strategy, a connection, or a label for a particular grouping. One word can stand for a range of these things. So our only viable alternative is to do away with any attempt to hardwire relationality into the database. That is, to rid it as far as possible of any ontological presumptions, by collapsing all the metadata fields into one. This flattening out of the metadata structure enables the word/phrase (or what the computer recognises as a text string) its maximum connective potential. The structuration of metadata into fields, the purpose of which is to aid searching, has the effect of inhibiting this process which can be understood to be the very foundation of Aboriginal knowledge production.

This absolute ontological flatness (which we in our current research imagine also involves dissolving the distinction between the data and the metadata) may not be the best way ahead. There may be a better more contrived solution. What we are searching for is some sort of ontological fluidity of the sort described by Srinivasan and Huang (2004) in their description of systems wherein three different communities of database users are able in various ways gradually to configure the data infrastructures to reflect and assist their particular ways and purposes of making meaning. Here we see potential for some dissolution of the normative and colonising power of the archive, as the distinction between the programmer and the user begins to dissolve, and the accountability

of each is located in the relations which make the technologies useful.

The second of the two enmities between database and narrative lies in the reluctance of a database to promote ongoing creative configuration of resources for knowledge production. For a database to be useful in the work of producing and reproducing collective memory, the ability of individuals to configure and to present, and of groups to assess and advocate (or refuse) carefully crafted configurations represented in particular ways in particular contexts, is critical. In other words, Aboriginal digital environments must work to support particular purposeful performance. The database (in our case of texts, audiofiles, movies and images – see http://www.cdu.edu.au/centres/ik/db_TAMI.html) does not contain facts or truths or truth claims. It contains traces of previous knowledge production episodes – which like art, dance, or the land itself (also a trace of an earlier ancestral knowledge production episode) – are resources for the work of producing more, ongoing truth claims or celebrations of history and identity in the here and now. In this economy, knowledge is always local, truth claims are always situated, performed and timely.

It is of course widely agreed by contemporary epistemologists that all knowledge is local but we tend to forget that when we visit the archive. When we work to refigure the archive, we must deliberately subvert the idea that knowledge is abstract, generalised, and objective and can be stored in a database. We need to recentre the work of creativity and intuition in our conceptualisations of epistemic work. We need to reclaim these processes in all our work. Consider for example these reflections of Allendoerfer (1962, p. 462), the American mathematician, on how mathematical research is actually done:

Beginning with nature, we seek to find as many relationships within it as we can. If we can systematize these we do so, but a lack of organization of our material does not keep us from pushing forward. On the basis of what we have observed we guess theorems and use these to derive other theorems. Immediately we rush to apply these back again to nature and proceed headlong if our predictions are successful. Axioms, logic and rigor are thrown to the winds, and we become intoxicated with our success and open to dreadful errors. This process is called intuition, and its nature is a matter of the greatest conjecture. The products of this intuitive discovery are frequently wrong, usually unorganized and always speculative. And so there follows the task of sorting them out, weaving them into a proper theory and proving them on the basis of a set of axioms. It is at this stage that the mathematical model is likely to be constructed. The details of the process go on in our seminars and in our

discussion in the corridors or meetings. Hence the inner circle of creative mathematicians have a well-kept trade secret that in a great many cases theorems come first and axioms second. The process of justifying a belief by finding premises from which it can be deduced is shockingly similar to much reasoning in our daily lives, and it is somewhat embarrassing to me to realise that mathematicians are experts at this art.

When Aboriginal elders are inducting their young people into their ancient knowledge traditions, they are not so much interested in teaching them the content of their knowledge, but the shared background which makes truth claims and performances possible and assessable, the practices of intuition which derive axioms from theorems, the modes of performance through which truth claims and performances can be made, and the complex ethical and aesthetic work which is done in validating and privileging some particular performances rather than others. This is largely an intuitive process rather than a logical one. It is also a social process interacting with a sentient environment. And it is accompanied by much singing, dancing, occasional levity and occasional reference to things hidden and dangerous. These are the contexts and processes which an Aboriginal digital environment must enter and support. The database – the “new symbolic form of ... computerised society” (Manovich, 2001 p. 219) – in which media objects are arranged with no beginning, no end, and no development theoretically or formally, provides the environment. It is the careful historically conscious journey through the environment which is essential to the liveliness of Aboriginal knowledge, and its viability depends upon young people learning by example to make that journey respectfully, creatively, and thoughtfully. If we commit ourselves to such a performative epistemology, we can collaborate to develop digital systems that keep Aboriginal environmental knowledge traditions healthy outside of the objectivist fantasy of commodifying and archiving “ethnobotany”, “ethnoecology”, “ethnopharmacology” and so on. An important step must be to recentre the role of creativity and intuition in our understanding of our own scientific practice, in order to negotiate digital environments which support rather than compromise Aboriginal knowledge traditions.

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