

Designing dynamic descriptive frameworks

Joanne Evans*

Dr Joanne Evans is a lecturer in the Faculty of Information Technology, Monash University, and coordinator of the Records Continuum Research Group, part of the Faculty's Centre of Organisational and Social Informatics. She has many years of experience in archival systems development, with the technologies she has been involved in designing and developing deployed into a number of research projects, as well as being utilised in small archives settings. Joanne undertook her PhD at Monash as part of the Australian Research Council Linkage-funded Clever Recordkeeping Metadata Project (2003–06) and received a Vice Chancellor's Commendation for Doctoral Thesis Excellence for her thesis, *Building Capacities for Sustainable Recordkeeping Metadata Interoperability*. Her research interests lie in the multifarious roles metadata plays in creating, managing and sustaining information and recordkeeping infrastructure and systems, with an increasing emphasis on the nature of archival design.

Cultural heritage professionals use descriptive metadata as a tool to manage and mediate access to the memory texts in their custody. With digital and networking technologies exploding the possibilities for capturing recorded memories and memorialising lives, loves and losses, they can, and should, revolutionise our recordkeeping metadata management frameworks. Embracing the 'archival turn' requires relinquishing our role as the dominant descriptive storyteller, but are our current descriptive models and systems a barrier rather than a facilitator of such a transformation? In this paper the author adopts an autoethnographical approach to explore her experience of developing archival systems since the advent of the Web in the mid-1990s. The story involves a range of metadata schemas and models, questioning their ability to enable the design of interfaces to recorded knowledge and memories that tap into and unleash the dynamic capabilities of the new technologies and their potential to reflect a multiplicity of voices. The paper will contribute to the growing body of literature about the role of archival professionals in shaping recorded memory through their standards and practices, challenging our image as merely silent partners and neutral players.

Keywords: archival description; archival systems; archival systems design methodologies; autoethnography; recordkeeping metadata

Introduction

Many archivists are all too aware of the enormity of the challenges facing the profession in this digital and networked information age. In two decades rapid evolution of Web and other information and communication technologies have transformed the Internet into a ubiquitous, pervasive, information infrastructure, embedded in our working, social, public and private lives. It has exploded the possibilities for capturing recorded memories, tracking activities and memorialising lives. Discussion and debate of our role in this new paradigm, of the sustainability and scalability of our systems and processes,

*Email: joanne.evans@monash.edu

and of the conceptualisations that do, and do not, help us make sense of this new landscape characterise the professional and scholarly literature.¹ In a pre-Internet world we could get away with the automation of paper-based records and archives management practices. But now understanding, harnessing and exploiting the capabilities of digital and networking technologies for archival and recordkeeping endeavours in a myriad of contexts – some old, mature and traditional, others new, emergent and transformational – is our grand challenge.² The design and development of frameworks, standards and tools for representing and managing recordkeeping metadata to address complexity and pluralisation in the context of a growing participatory archives movement is a key part of this agenda.³

Design challenges for archival descriptive frameworks

Recordkeeping metadata are the layers of structured information which tie recorded information objects to the contexts in which they are created, managed and used, so that they may function as authentic and reliable evidence of those activities.⁴ Records do not exist without recordkeeping metadata, whether it is implicit, explicit, intrinsic or extrinsic. It enables records to be discoverable, accessible and interpretable, formulating and structuring evidential and memory management frameworks. Records are networked information objects, bound in webs of evidentiary and contextual relationships.⁵ We now have digital and networking technologies to fully exploit this characteristic.

Traditional archival description practices have relied on recordkeeping metadata inscribed on physical records, reflected in their arrangement and documented in current recordkeeping tools.⁶ They involve re-creating and augmenting it through archiving processes, making business and recordkeeping contexts explicit as records are removed from their originating environment and transferred to an archive.⁷ Archivists have then made this metadata available in a variety of forms, for example, through finding aids, catalogues, indexes and registers, to facilitate discovery, access and further use of the records.

From a records continuum perspective this is but one way in which description, a ‘complex multi-layered recordkeeping function’ which creates, captures, organises and pluralises recordkeeping metadata, may be enacted.⁸ Layers of recordkeeping metadata capture and tell past and ongoing stories of the records,⁹ and as records themselves, are also ‘always in the process of becoming’.¹⁰ Rather than just supporting static cataloguing and freezing records in archival stasis, our descriptive frameworks need to facilitate capture of dynamic webs of transactions and relationships to document ‘juridical-administrative, provenancial, procedural, documentary and technological contexts’ of creation, management and use.¹¹

The nature, availability and accessibility of recordkeeping metadata impacts what is remembered, how it is remembered and what gets forgotten.¹² Heather MacNeil calls for archivists to look into ‘surrendering our role as invisible and omniscient narrators and accepting that we are among the characters in the story told through our descriptions’ and so need ‘to render an account of our role and responsibility in the process of our representation’.¹³ She also advocates for transforming practices to capitalise on networking capabilities of new information technologies:

The Web is an ideal vehicle for transcending the artificial limits imposed by current descriptive practices and for exploiting an expanded vision of archival description; one that unseats the privileged status currently accorded to the standards-based finding aid and repositories it as a complex network of hyperlinked and interactive documentation relating to

the history, appraisal, preservation, use and interpretation of a body of records over time. Such a network could provide users with multiple pathways to explore, which the user would be free to pursue or ignore. It could also provide users with the opportunity to create new pathways by incorporating spaces in which users are free to contribute additional perspectives and alternate readings on the records and their representations.¹⁴

Can our existing descriptive infrastructure support this vision? Are we able to just tack it on to what we currently do? Or does it require a more extensive transformation? Other communities, primarily in information discovery spaces, are using semantic web technologies to create networks of description around information resources.¹⁵ Can we adopt what they are doing? Are these technologies and networks archival? If not, what adaptations are needed to encompass archival dimensions and support intergenerational transmission of evidence and memory?

Responding to these calls to transform our descriptive frameworks requires understanding, not just of particular technologies, systems and requirements, but of design itself. Designing is a multi-faceted, recursive, iterative and reflexive process which transforms an idea into some kind of material form, to make a useful difference to the situation or task at hand.¹⁶ It is a complex, structured, creative, problem-solving activity in which prior understandings are built upon, developed and transformed as conceptualisations materialise. Good design transports us to a better place, while poor design frustrates and obstructs. A key research question is, what designing skills and knowledge do we need to facilitate networks of archival descriptive systems?

Autoethnographical approach

To investigate this question, I have adopted an autoethnographical approach to examine my experience as an archival systems designer and developer. Over a 15-year period I have been responsible for designing and deploying database software to document and manage records and facilitate their discovery, access and use. With hindsight it can be viewed as an action research process in which ‘exploration of the interface between theory and practice’ and ‘interplay[s] with technology’ have been explored through a variety of projects.¹⁷ Iterative and reflexive design of archival database systems has been a method in which I have explored the informatics of recordkeeping and archival systems, and come to a better understanding of the nature and needs of recordkeeping metadata.

While the systems I have designed and developed have been judged from their external presence,¹⁸ I provide here ‘an interpretive reading from the inside’¹⁹ and reveal how they are constructs of people, place, time and community as much as technology. Autoethnography is a way of studying my own experience to develop a deeper understanding of the interplay between these constructs in the investigation of designing processes.²⁰ It also puts my archival practice within the research frame rather than being an invisible and silent force.²¹ This extends MacNeil’s point about making the role we play in shaping archival description explicit to the information infrastructure we have constructed in support of our practices.

Autoethnography enables me to get inside my archival design processes in order to systematically describe and analyse them as cultural practice.²² I want to reveal how they have been shaped and influenced by archival doing and thinking, and in turn, through the use that is made of the system, how they then shape and influence archival practice. The aim is for a ‘thick’ description which sheds insights onto archival design processes, and the design knowledge and skills needed to transform them.

I also want to discuss my particular story of developing archival systems within an Australian context to complement and contrast with those from other contexts.²³ When I started out in the archival profession I took for granted a singular descriptive practice which subsequent international engagement has shown is far from the reality. This raises questions of whether the plurality of archival contexts should be better represented in our international archival description standards rather than their current tendency to assume that a mono-culture is achievable and desirable. This paper is fodder for such a debate.

Designing and developing archival systems

ASAP and the ADS

My story begins in 1995 when I landed my first job with newly minted postgraduate information management qualifications at the Australian Science Archives Project (ASAP). As the ‘project’ in its name suggests it was not a traditional archival institution. Established in the mid-1980s by historians of Australian science at the University of Melbourne, ASAP’s role was to facilitate the transfer of records relating to Australian science, medicine and technology into archival repositories. It was a response to an internationally recognised need to improve the representation and documentation of scientific records in archival collections and to establish appropriate frameworks for their appraisal in the light of the massive expansion in their volume, especially post – World War II.²⁴ ASAP never intended to become an archival repository; it only ever acted as a temporary store of records for processing on route to the shelves of an appropriate archival institution or back into in-house archives.²⁵

The establishment of ASAP coincided with the emergence of a post-custodial discourse in the Australian and international archival community, with the intellectual control over distributed archives, rather than just the caretaking of records in custody, as the focus and scope of archival endeavours.²⁶ In such a climate, ASAP became a place for exploring the tools and technologies of a post-custodial archival organisation, and part of the Australian community of practice investigating recordkeeping and archiving from a continuum perspective.²⁷

To support the processing of records for archival transfer, ASAP invested in database technology and developed the ADS (Archival Data System). It was modelled on the Commonwealth Record Series system, and featured the separate documentation of records, their aggregations, and the organisations and persons associated with their creation and use, and then the programmatic assemblage of these descriptions into finding aids via interrelationships. From this processing tool documentation was generated for the originating creator or custodian of the records, the archival repository that would manage them and for historians and others who would access the records. The database approach enabled descriptive metadata to ‘document record content, context, continuity and structure to enable the maintenance of integrity and enhance accessibility’ to be captured once and then reproduced in a variety of forms and formats.²⁸

The database approach also helped to manage an uncertain and often drawn-out process. It could take many years from initial identifying of records of interest, establishing their scope, securing funding for their processing, carrying out that processing and then, if needed, transferring the records to their new custodian. It also could involve many different players and featured periods of activity and inactivity. ASAP’s self-funded status also created a strong desire to develop efficient processes and tools which could be used from one project to another. This focus also meant ASAP was an avid monitor of

standard developments in archival and other communities of interest for benchmarking or integrating into the ADS.

The ADS was iteratively developed through a number of processing projects which started small, dealing with the records of individuals and small organisations, and gradually got larger. It culminated in using the system in a series of large processing projects for the records of Generation Victoria, the generation arm of the State Electricity Commission of Victoria, as it was privatised in the mid-1990s. It was the first of these projects that led to my employment at ASAP, initially as the project leader for the first stage of the project and then as the key developer of the ADS as it was migrated to Microsoft Access and its interfaces for management, discovery and access enhanced.²⁹

The ADS and the Australian Series System

It was through this process that I was introduced to the Australian literature on archival systems, and the writings of Peter Scott³⁰ and Chris Hurley³¹ in particular. Grappling with data structure and interface design questions, I found their words were of immense practical help as I was introduced to a relational network view of archival description. They enabled me to align ADS development with the Australian Series System Model, while at the same time being aware of where technological and other pragmatics meant concessions. No implementation of the Australian Series System Model is devoid of such compromises. I am well aware of where I have had to bury bones in my systems, hopefully to be remedied at a later stage. As has been pointed out, some of the critique levelled at the model may be more to do with the limitations of any particular implementation rather than deficiencies in the conceptualisation.³² Designing requires awareness of when practical compromises are a necessity, coupled with the ability to anticipate and judge their consequences.

My enthusiasm for relational database technology and the Australian Series System Model can be seen in a paper prepared for the 1997 Australian Society of Archivists' Conference:

now the computer technologists have caught up and we have ... the tools to create the system Scott was searching for. With a computer database, the context, record or relationship needs only be documented once. It can then be used in any number of displays – screen, print copy, html and beyond. Fielded information rather than unwieldy slabs of text allow searching and grouping across attributes, so archivists and archives users have a myriad of access points and ways of selecting archival data to satisfy information needs.³³

It also reflected discussions at ASAP about what we were doing, whether it was effective and how we might better harness the technology to do things smarter and achieve better outcomes. We were encouraged to keep track of what was happening at the cutting edge of information technologies, and to aspire to translate it directly into our processes and systems. Archiving was not about conserving and preserving a staid past, but innovatively securing capabilities into the systems of the future.

One particular area in which we felt we were making a unique contribution to the continuum community of practice was in our processing methodology. Supported by the relational database capabilities of the ADS, we took accessioning to where and when we first came into contact with records, encompassing description of everything sighted, not just that which would subsequently be appraised to have continuing value.³⁴ MacNeil writes of the 'misleading impression of completeness' as 'a

description of a body of records is constructed out of incomplete fragments of evidence'.³⁵ She suggests we look to the language of archival description to better 'signal to users the gaps in our knowledge'. The ADS experience shows that the language we use in description is only part of the problem. Our processes and data structures need to be designed to capture and represent *all* rather than just part of *our* story in relation to the archival processing of records.

The ADS aimed to support description as a dynamic process. We 'inventory processed' records rather than arranging and describing records. Accessioning would identify initial series and provenance entities but it was through detailed processing of the records that fuller details of relationships to contextual entities were uncovered. It was not about starting with 'fully fledged and finely honed series and provenance descriptions'³⁶ but allowing for these to emerge in the processing. We often dealt with much-neglected records, remnants of a multitude of recordkeeping systems employed throughout a person's or an organisation's lifetime. Not the relative neatness of government registry systems with documentation of the registry's recordkeeping still extant and accessible.

With the ADS we were not just automating manual descriptive processes but thinking about where technology could enable their refiguring:

Hence the ADS is not just an automated finding aid. It is an archival management information system. It is a processing tool. It documents records from the time they are identified as part of a records program, through to arrangement and physical location in an archival repository, and beyond to their subsequent use. It brings the many processing and finding aids archivists produce within the one integrated system.³⁷

From ADS to HDMS

The completion of the Generation Victoria projects in 1998 brought about a refocusing of ASAP's efforts. It involved going back to working on smaller collections, and with the Web gaining momentum, developing mechanisms for producing HTML finding aids. Organisational change led to ASAP becoming the Australian Science and Technology Heritage Centre (Austehc) and the ADS became the HDMS (Heritage Documentation Management System). The rise of the open source software movement also enabled us to adopt this kind of model for making our system available to others. First-hand knowledge of the effort and expertise that goes into building an archival processing and documentation management system and of the benefits that it could bring made it an imperative.

This and the establishment of Austehc was a statement. We did not want to be software vendors, nor just a history of science project. We were an archival research centre, with modularised, iterative and reflective design, development and deployment of archival systems our methodological focus. Keen to continuously improve the HDMS, we felt that the open source approach could build community capacity, delivering an automation product to the archives community with a minimum of technical barriers, and foster collaborative partnerships for further developments. It could promote efficient and standardised practices, so that smaller archives could more easily gain intellectual and physical control over their records and make this available to users via the Web, participating alongside bigger state and federal government archives and collecting institutions.³⁸

We also wanted to remain responsive to practical needs as our experience had shown that the better developments were driven by the demands of real rather than imagined situations. They produced a focused system rather than one overloaded with

‘bells and whistles’ that someone thought ‘might’ be useful someday. Along with this was a firm belief in the benefits of modularisation and incremental development rather than attempting to specify a perfect system up-front. The HDMS accrued functionality, demonstrating the benefits of a generic integrated approach rather than producing customised discrete systems. Tailoring came in the way the software was deployed and in the protocols governing archiving processes in particular contexts.

HDMS and EAD

A project with the National Archives of Australia in 1999 gave us the chance to engage with the Encoded Archival Description (EAD) standard. EAD was developed by the US archival community in the mid-1990s as a structured mark-up language to foster web publishing of archival finding aids, catalogues and guides to records.³⁹ We had built an HTML finding aid generator, and so this project aimed to develop an EAD one, perhaps to replace the HTML one, and through this report on the application of EAD in an Australian Series System context.

Replacing presentational mark-up with structured mark-up was, and still is, highly appealing. With the HTML generation framework in place, re-working to produce EAD was technically pretty straightforward. It took just a few days of programming to develop the ‘proof of concept’ version. But translating EAD-XML generated output into HTML was a much trickier proposition than it is today. Browser support of XSL, the style sheet language for translating from XML to HTML, was patchy and browser-specific, and systems to manage the web rendering of XML or SGML documents were expensive.

Aside from these technicalities, the bigger issue was that the data structures of EAD could not adequately represent the rich network of relationships between accession, inventory, series and provenance entity descriptions captured in the HDMS. It only allowed for these to be bundled up into a hierarchy. Moving from HTML to EAD would have involved much more work to achieve a lesser outcome. This work highlighted the difference between the document-based approach to archival description underpinning EAD versus the database approach embodied in the Australian Series System. We concluded that for EAD to be relevant in our context it would need to incorporate appropriate structures for marking up these relationships to represent networks of archival description rather than just hierarchies.⁴⁰

HDMS today

Opportunities to further develop the HDMS since this EAD project have been limited. It still provides the backbone for the archival processing work undertaken by the eScholarship Research Centre, the unit that Austhec has since become, and is also used by a number of archives. As a traditional archival control system, it enables the documentation of records from a singular records creator perspective, with other stakes in records captured within textual descriptions or using indexing mechanisms.⁴¹ Its capacity to deal with a multiplicity of voices is circumscribed by its design, and reflective of the time and place in which it was developed. It has yet to come to terms with evolutions in web technologies and capabilities over the past decade, so while static HTML finding aids can be generated and published, there is no scope for capturing how these are used or for users to add their own perspectives on the records. However, before we can push into this kind of paradigm, we need what the HDMS does deliver – a

processing tool to uniquely identify and manage appropriately structured descriptive units and allow for dynamic documentation of their interrelationships.

OHRM and WWW

Early 2000 saw my design focus switch from the HDMS to what became known as the OHRM. This system grew from ASAP's earlier work in establishing a Register of Australian Science Archives (RASA). To play its role in facilitating the transfer of records to archival institutions, ASAP needed to document where records were currently held and where arrangements between scientists and/or their families and archives, museums or libraries already existed. It was clear that this information would be of value beyond ASAP, useful for historians, scientists and archivists in discovering, appraising and using archives of Australian science.⁴²

The story of RASA has been told elsewhere,⁴³ but its design principles need highlighting here. It built from existing work, using Anne Moyal's 1966 *Guide to the Manuscript Records of Australian Science*, re-engineered using relational database technology and an Australian Series System approach. Even though the first publication plan was to produce the register as a book, the database approach was in recognition of the need for an informatic which would allow for its continual updating. Separate database tables documented context, records, custody and the interrelationships between them. Output was generated and published as the *Guide to the Records of the Archives of Science in Australia* in 1991.⁴⁴

With the advent of the World Wide Web in 1994, in Tim Sherratt's hands, RASA became *Bright Sparcs*, incorporating the annual History of Australian Science Bibliography from the *Historical Records of Australian Science*, as well as the *Directory of Archives in Australia* to update and expand the information available about repositories.⁴⁵ It re-purposed and re-imagined these paper-based reference tools to take advantage of the capabilities of web technologies. It featured the unique persistent identification of descriptive entities – people, archives, published resources and archival repositories – and then the mapping of relationships between these entities to allow a complex hypertext network to emerge. The Australian Series System Model once again in action.

My role in 2000 was to take the bespoke *Bright Sparcs* database and turn it into a generic system, so others could create their own such network. It was named the Online Heritage Resource Manager (OHRM); a name which it has outgrown although the acronym has stuck. Over a decade later the OHRM has enabled the web publication of a number of contextual knowledge networks, including the *Australian Women's Register*, *Encyclopedia of Australian Science*, *Australian Dictionary of Biography Online*, *Agreements, Treaties and Negotiated Settlements (ATNS) Database*, *Chinese-Australian Historical Images in Australia (CHIA)* and, most recently, the *Find and Connect Web Resource*.⁴⁶ As an archival system, it enables these resources to be built for the long term, which in a digital and networked world implies openness, scalability and interoperability.

With hindsight, I can categorise my development work with the ADS/HDMS as being about learning the informatics of the Australian Series System, whereas with the OHRM it has been about expanding and exploiting it. As the potential of the OHRM unfolded, so too did the philosophy underpinning its design. The aim has been to standardise the back-end system (the relational database) on appropriate archival, scholarly, design, accessibility and usability principles, while customising the front-end system

(the hypertext network) on appropriate archival, scholarly, design, accessibility and usability principles. The development of the *Find and Connect Web Resource* was an opportunity to articulate a set of 10 principles ‘embedded in the informatics and programming code of the OHRM, the web publication practices and processes, and in the experience and skills of the project team’.⁴⁷

With standards-based as the first of these principles, the OHRM design journey has featured engagement with a number of metadata schemas and standards.⁴⁸ In looking to extant metadata schemas and descriptive standards my initial focus was on improving the structure of descriptive entities, but it soon became clear that the OHRM also needed to improve ways to capture, represent and then present the relationships between them. This informed my involvement in working groups for the ISO 23081 Standard for Recordkeeping Metadata, where I was a strong advocate of relationships as first-order entities in the modelling of recordkeeping metadata. If building the OHRM from scratch today I would bring relationships to the forefront in the data model and interfaces. The system features some programmatic kludges in this area resulting from a lack of understanding of their entity status in early development work.⁴⁹ It is an imperfect rendering and an example of where studying the OHRM artefact would give you an incomplete picture of what was (or is now) in the mind of its designer.

What I did get right early on was building the capacity for OHRM implementers to define their own relationship and entity types, rather than hard-wiring into the data structures those predominantly used in archival standards. This has allowed implementers to define their own ontology of contextual entities and relationships, within standard structures for resource and entity description based on community needs. This has significantly contributed to the diversity of ways in which the OHRM has been deployed with different resource and entity types having the descriptive focus. For *ATNS* this focus is on agreements, treaties and other negotiated settlements between Australian Indigenous communities and other bodies; for *CHIA* description revolves around photographic images and how they have been portrayed in narratives of Chinese-Australian experience.

OHRM and Web 2.0

As OHRM development unfolded during the 2000s, so too did the Web. Trends towards open, integratable technologies and systems became known as Web 2.0, turning web use from passive consumption to active creation, and releasing the might of network effects.⁵⁰ We studied Web 2.0 design principles with interest to see where the OHRM was at, concluding that while a product of the pre-Web 2.0 world, it had Web 2.0 leanings. It can generate a niche site of valuable content for a wide variety of users (the long tail), it is based on citation principles and making content open and accessible (some rights reserved, cooperation over control). Its relational model allows network effects to be exploited in the user experience, with its modularity and iterative content-driven design approach reflective of lightweight services and the notion of the perpetual beta.

Where it has fallen behind is in its architecture of participation. While the OHRM data model allows for citation of resources to enrich entity descriptions, the power to do this is in the hands of the OHRM implementer rather than in the user community. Where OHRM projects have incorporated comments and feedback mechanisms, they currently require moderation and manual translation of user contributions into the system’s data structures. While many archival institutions are making forays into this area, there is a need for research into participatory descriptive frameworks, especially around

enabling them to be archival rather than ephemeral, and integral to descriptive practices. For the archival community I believe that the design challenges go beyond using Web 2.0 to interact with end users, encompassing how these technologies reshape all of our processes and systems.

Interoperability and OAI-PMH

In 2008, an Australian Research Council Linkage Infrastructure Equipment and Facilities Grant enabled some investigation of a federated information architecture for the *Australian Women's Register*, an OHRM flagship and driver of key innovations since its establishment in 2000.⁵¹ In this project we less successfully investigated community methods for populating the *Register*, but more successfully enabled the harvesting of its content using Encoded Archival Context and the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) into the National Library of Australia's Trove discovery service. It gave a glimmer of how descriptive frameworks could be transformed if metadata exchange was bilateral, with sharing and augmenting rather than continuous manual re-creating. Further research and development is needed to put this technical layer in place and to investigate the impact it then has both on the processes for populating a resource such as the *Register* and on interfaces. This would help further understanding of the information interoperability services that institutional players should be looking to provide to facilitate participatory descriptive networks.

Archival design

How does this exploration and reflection on my experiences in designing and developing archival systems help in identifying the designing skills and knowledge needed to facilitate networks of archival descriptive systems? Firstly it illustrates how design is 'a reflective conversation with the materials of a situation'; a process that not only produces an artefact of some kind, but where the designer learns, through reflecting-in-action and reflecting-on-action, about 'the construction of the problem, the strategies of action, or the model of the phenomena'.⁵² This means that there are both explicit and tacit outcomes. In my case the tacit skills and knowledge could be translated into the next project and the next iteration of the system. Also as I was working in a university environment with scholarly communication encouraged, it could be achieved through publication, community engagement and the sharing of the systems through open source licences. This does highlight the importance of a robust professional and scholarly discourse to allow for the stories of and around designs of new archival and recordkeeping technologies to be revealed and shared, along with the technologies themselves. We are at a moment where, as we transition into a digital and networked information age, such sharing of technologies, experience and knowledge is vital.

Telling these stories helps us understand and develop our own informatics – the fundamental nature of the structures and processes of archival and recordkeeping systems – so that appropriate interventions, improvements and transformations can be designed and developed. It is no longer just about building our own systems, but facilitating the embedding and embodiment of archival and recordkeeping capabilities in systems, tools and ways of working with digital stuff in a networked world. Archival design is our concern. While others are designing and building synchronic (in time) information networks for discovery and access, we need to be responsible for designing the diachronic (through time) and evidential capabilities into those networks. I am concerned about a

tendency within the archival community to assume others will take care of our design concerns in their software, or alternatively just make do with the data structures and functionality they provide. We must be aware of and able to judge the values and tacit assumptions packed into digital technology, particularly where they are at odds with the needs of recordkeeping and archival systems.

My archival design journey also demonstrates how the designs of our systems are a record of archival processes, practices and contexts, as well as a reflection of archival paradigms. In the case of the HDMS and the OHRM, awareness of the conceptual framework on which they are built is overt, and as I have noted one of my motives in telling this story was to highlight this to enable comparison and contrast with those coming from other descriptive contexts. It also serves to further MacNeil's point – our omniscient narration extends to not just our descriptions but our descriptive systems. Their structure and functionality impacts on what gets remembered, how it gets remembered and the degree to which others can participate in our evidential and memory management frameworks.

My design and development experience is supportive of the need to move away from hierarchical descriptive models and towards networked ones in order to enable greater participation. These have the potential to represent complex and ongoing relationships between people, stories and records, but we have a way to go in opening up our descriptive silos so that they can function as nodes in a participatory network. A key responsibility is how we do this archivally and enable appropriate evidence of these dynamic networks of documentation to be carried forward through time. We need participatory archival design methodologies to foster the development of archival systems configured around community information, self-knowledge and memory needs leading to transformative changes in archival description, access and other recordkeeping services.

Conclusion

The role of archivists in this new descriptive paradigm is to be less involved in crafting archival descriptions and more involved in creating sustainable, scalable and open archival descriptive frameworks. As an archival systems developer I have had the delight of seeing where the knowledge, skills, context, imagination and creativity of those who use my systems can take them. I've been challenged and inspired to innovate in order to support their needs, while at the same time embedding archival and recordkeeping principles into their practices. Standardisation does not have to be a straitjacket. If we get it right then it can be the building block for robust and resilient participatory archival networks, organic in nature, responsive to local community needs, but also connectable into broader global frameworks, and able to support multiple journeys through space and time.

Endnotes

1. David Bearman, 'Record-Keeping Systems', *Archivaria*, no. 36, Autumn 1993, pp. 16–37; Terry Cook, 'Electronic Records, Paper Minds: The Revolution in Information Management and Archives in the Post-Custodial and Post-Modernist Era', *Archives and Manuscripts*, vol. 22, no. 2, November 1994, pp. 300–29; Margaret Hedstrom, 'Descriptive Practices for Electronic Records: Deciding What is Essential and Imagining What is Possible', *Archivaria*, no. 36, Autumn 1993, pp. 53–63; Frank Upward, Sue McKemish and Barbara Reed, 'Archivists and Changing Social and Information Spaces: A Continuum Approach to

- Recordkeeping and Archiving in Online Cultures’, *Archivaria*, no. 72, Fall 2011, pp. 197–237; Terry Cook, “‘We Are What We Keep; We Keep What We Are’: Archival Appraisal Past, Present and Future’, *Journal of the Society of Archivists*, vol. 32, no. 2, 2011, pp. 173–89, doi:10.1080/00379816.2011.619688.
2. Anne J Gilliland and Sue McKemmish, ‘Recordkeeping Metadata, the Archival Multiverse, and Societal Grand Challenges’, in *Proceedings of the International Conference on Dublin Core and Metadata Applications 2012*, 2012, available at <<http://dcevents.dublincore.org/index.php/IntConf/dc-2012/paper/view/108>>, accessed 27 September 2012.
 3. Andrew Flinn, ‘Independent Community Archives and Community-Generated Content “Writing, Saving and Sharing Our Histories”’, *Convergence: The International Journal of Research into New Media Technologies*, vol. 16, no 1, 1 February 2010, pp. 39–51, doi:10.1177/1354856509347707; Andrew Flinn, Mary Stevens and Elizabeth Shepherd, ‘Whose Memories, Whose Archives? Independent Community Archives, Autonomy and the Mainstream’, *Archival Science*, vol. 9, nos 1–2, October 2009, pp. 71–86, doi:10.1007/s10502-009-9105-2; Alexandra Eveleigh, ‘Welcoming the World: An Exploration of Participatory Archives’, presented at the ICA Congress 2012, Brisbane, 2012, available at <<http://www.ica2012.com/files/pdf/Full%20papers%20upload/ica12Final00128.pdf>>, accessed 7 May 2013; Isto Huvila, ‘Participatory Archive: Towards Decentralised Curation, Radical User Orientation, and Broader Contextualisation of Records Management’, *Archival Science*, vol. 8, no. 1, March 2008, pp. 15–36, doi:10.1007/s10502-008-9071-0; Katie Shilton and Ramesh Srinivasan, ‘Participatory Appraisal and Arrangement for Multicultural Archival Collections’, *Archivaria*, no. 63, Spring 2007, pp. 87–101.
 4. Sue McKemmish et al., ‘Describing Records in Context in the Continuum: The Australian Recordkeeping Metadata Schema’, *Archivaria*, no. 48, Fall 1999, pp. 3–43.
 5. Chris Hurley, ‘The Hunting of the Snark: Looking for Digital “Series”’, 2011, available at <<http://www.descriptionguy.com/images/WEBSITE/hunting-of-the-snark-search-for-digital-series.pdf>>, accessed 25 January 2014.
 6. Sue McKemmish, Adrian Cunningham and Dagmar Parer, ‘Metadata Mania: Use of Metadata for Electronic Recordkeeping and Online Resource Discovery’, in *Place, Interface and Cyberspace: Archives at the Edge, Proceedings of the 1998 Conference of the Australian Society of Archivists, Fremantle 6-8 August 1998*, Australian Society of Archivists, Canberra, 1998, available at <<http://www.infotech.monash.edu.au/research/groups/rcrg/publications/recordkeepingmetadata-sm01.html>>, accessed 2 September 2012.
 7. Chris Hurley, ‘The Making and Keeping of Records: (1) What Are Finding Aids For?’, *Archives and Manuscripts*, vol. 26, no. 1, May 1998, pp. 58–77.
 8. McKemmish et al., ‘Describing Records in Context in the Continuum’, p. 8.
 9. Wendy Duff and Verne Harris, ‘Stories and Names: Archival Description as Narrating Records and Constructing Meanings’, *Archival Science*, vol. 2, nos 3–4, 2002, pp. 263–85, doi:10.1007/BF02435625.
 10. Sue McKemmish, ‘Are Records Ever Actual?’, in *The Records Continuum: Ian Maclean and Australian Archives First Fifty Years*, Sue McKemmish and Michael Piggott (eds), Ancora Press, Clayton, 1994, pp. 187–203.
 11. Gilliland and McKemmish.
 12. Duff and Harris; Gilliland and McKemmish.
 13. Heather MacNeil, ‘Picking Our Text: Archival Description, Authenticity, and the Archivist as Editor’, *American Archivist*, vol. 68, no. 2, 1 September 2005, p. 272.
 14. *ibid.*, p. 276.
 15. Christian Bizer, Tom Heath and Tim Berners-Lee, ‘Linked Data – The Story So Far’, *International Journal on Semantic Web and Information Systems*, vol. 5, no. 3, 2009, pp. 1–22, doi:10.4018/jswis.2009081901.
 16. Nigel Cross, *Designerly Ways of Knowing*, Springer London, London, 2006, available at <http://link.springer.com/chapter/10.1007/1-84628-301-9_1>, accessed 21 January 2013.
 17. Joanne Evans and Nadav Rouche, ‘Utilizing Systems Development Methods in Archival Systems Research: Building a Metadata Schema Registry’, *Archival Science*, vol. 4, nos 3–4, December 2004, pp. 315–334, doi:10.1007/s10502-005-2598-4.
 18. Toby Burrows, ‘Identity Parade: Managing Contextual Personal Information for Archival Data’, *Archives and Manuscripts*, vol. 36, no. 2, November 2008, pp. 88–104.

19. Kathy Charmaz, 'Premises, Principles, and Practices in Qualitative Research: Revisiting the Foundations', *Qualitative Health Research*, vol. 14, no. 7, 2004, pp. 976–93, doi:[10.1177/1049732304266795](https://doi.org/10.1177/1049732304266795).
20. Sarah Wall, 'An Autoethnography on Learning About Autoethnography', *International Journal of Qualitative Methods*, vol. 5, no. 2, 2006, pp. 146–60.
21. Andrew C Sparkes, 'Autoethnography and Narratives of Self: Reflections on Criteria in Action', *Sociology of Sport Journal*, vol. 17, no. 1, 2000, pp. 21–43.
22. Carolyn Ellis, Tony E Adams and Arthur P Bochner, 'Autoethnography: An Overview', *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, vol. 12, no. 1, 24 November 2010, available at <<http://www.qualitative-research.net/index.php/fqs/article/view/1589>>, accessed 23 January 2014.
23. Ciaran Trace and Andrew Dillon, 'The Evolution of the Finding Aid in the United States: From Physical to Digital Document Genre', *Archival Science*, vol. 12, no. 4, December 2012, pp. 1–19, doi:[10.1007/s10502-012-9190-5](https://doi.org/10.1007/s10502-012-9190-5); MacNeil, 'Picking Our Text'; Heather MacNeil, 'What Finding Aids Do: Archival Description as Rhetorical Genre in Traditional and Web-Based Environments', *Archival Science*, vol. 12, no. 4, December 2012, pp. 485–500, doi:[10.1007/s10502-012-9175-4](https://doi.org/10.1007/s10502-012-9175-4).
24. Clark A Elliott, *Understanding Progress as Process: Documentation of the History of Post-War Science and Technology in the United States*, Society of American Archivists, Chicago, 1983.
25. Processing *in situ* was often preferred, given the potential access it afforded to contextual knowledge 'in living finding aids, the minds of record creators and users', Hurley, 'The Making and Keeping of Records', p. 60.
26. Frank Upward, 'Structuring the Records Continuum: Part One: Postcustodial Principles and Properties', *Archives and Manuscripts*, vol. 24, no. 2, November 1996, pp. 268–85.
27. Sue McKemmish, 'Placing Records Continuum Theory and Practice', *Archival Science*, vol. 1, no. 4, December 2001, pp. 333–59, doi:[10.1007/BF02438901](https://doi.org/10.1007/BF02438901).
28. Australian Science Archives Project, 'ASAP Annual Report 1996', 23 January 1998, available at <http://www.asap.unimelb.edu.au/pubs/reports/1996/ar96_3.htm>, accessed 9 September 2012.
29. *ibid.*
30. Peter Scott, 'The Record Group Concept: A Case for Abandonment', *American Archivist*, vol. 29, no. 4, October 1966, pp. 493–504.
31. Chris Hurley, 'Description', *Chris Hurley's Stuff*, 2012, available at <<http://www.descriptionguy.com/description.html>>, accessed 28 November 2013.
32. Barbara Reed, 'The Australian Context Relationship (CRS or Series) System: An Appreciation', in *The Arrangement and Description of Archives Amid Administrative and Technological Change: Essays and Reflections By and About Peter J. Scott*, Adrian Cunningham (ed.), Australian Society of Archivists, 2010, pp. 346–73.
33. Joanne Evans, 'Structure of the ADS', in *Archives and Reform – Preparing for Tomorrow, Proceedings of the Australian Society of Archivists Conference, Adelaide, 25–26th July 1997*, 1997, available at <<http://www.asap.unimelb.edu.au/pubs/articles/asa97/ADSStructure.htm>>, accessed 9 September 2012.
34. *ibid.* 'The idea is that all records identified in the accessioning process are documented at the series and inventory level. We aim to document the total records environment. Not only do the inventory, series and provenance tables contain archival documentation of records of continuing or long term value, but they also document other records created and used by an organisation or individual related to the surviving records, building a picture of the total recordkeeping environment. Varying the inventory unit ensures that high value records can be documented to a more detailed level than those of lesser value or those scheduled for destruction. In this way the ADS facilitates the systematic documentation of all records and what is done with them.'
35. MacNeil, 'Picking Our Text'.
36. Evans, 'Structure of the ADS'.
37. *ibid.*
38. Shannon Faulkhead, Joanne Evans and Helen Morgan, 'Is Technology Enough? Developing Archival Information Systems in Community Environments', *ESARBICA Journal*, vol. 24, 2005, pp. 74–95, doi:[10.4314/esarj.v24i1.30997](https://doi.org/10.4314/esarj.v24i1.30997).

39. Daniel V Pitti, 'Encoded Archival Description', *D-Lib Magazine*, vol. 5, no. 11, November 1999, doi:10.1045/november99-pitti.
40. Joanne Evans, *REEA – Building an Encoded Archival Description (EAD) Generator for the HDMS*, Australian Science and Technology Heritage Centre, July 2000, available at <<http://www.austehc.unimelb.edu.au/HDMS/HDMSeadreport.pdf>>, accessed 28 November 2013.
41. An example of this is the use of the indexing functionality by the South Australia Museum Archives, see <<http://www.samuseum.sa.gov.au/collections/information-resources/archives-search>>, accessed 28 November 2013.
42. Gavan McCarthy, *Guide to the Archives of Science in Australia: Records of Individuals*, D W Thorpe, 1991.
43. Gavan McCarthy and Joanne Evans, 'Mapping the Socio-Technical Complexity of Australian Science: From Archival Authorities to Networks of Contextual Information', *Journal of Archival Organization*, vol. 5, nos 1–2, 2008, pp. 149–75, doi:10.1300/J201v05n01_08.
44. McCarthy.
45. Tim Sherratt, 'Pathways to Memory', in *Proceedings of AusWeb96 – The Second Australian World Wide Web Conference*, Southern Cross University, 1996, available at <<http://discontents.com.au/words/articles/pathways-to-memory>>, accessed 14 September 2012.
46. Gavan J McCarthy and Joanne Evans, 'Principles for Archival Information Services in the Public Domain', *Archives and Manuscripts*, vol. 40, no. 1, March 2012, pp. 54–67, doi:10.1080/01576895.2012.670872.
47. *ibid.*, p. 57.
48. For example ISAD(G), ISAAR(CPF), CIDOC CRM, Dublin Core, FRBR, EAD and EAC-CPF.
49. One of those bones that I know is buried in the OHRM artefact.
50. Tim O'Reilly, 'What is Web 2.0?', *O'Reilly Media*, 30 September 2005, available at <<http://oreilly.com/web2/archive/what-is-web-20.html>>, accessed 15 September 2012.
51. Nikki Henningham, Joanne Evans and Helen Morgan, 'Out of the Shadows: Using Technology to Illuminate Women's Archives', in *Women's Memory: The Problem of Sources, 20th Anniversary Symposium of the Women's Library and Information Centre Foundation 17–19 April 2009, Kadir Has University, Istanbul, Turkey*, Women's Library and Information Centre Foundation, Istanbul, 2009, pp. 389–99.
52. Donald A Schön, *The Reflective Practitioner: How Professionals Think in Action*, Basic Books, New York, 1984.