



## **Mapping the past:**

### **Building public knowledge places to meet community needs**

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#### **Abstract**

Contemporary web-based technologies have enabled torrents of information to arrive at our doorstep. Much of this information documents the here and now and most of it disappears leaving little trace. It services our need for news and may help people feel connected to the world in which they live. This knowledge of the present also synchronizes communities and creates webs of relationships critical for functional and operational effectiveness. However, it is argued, that this synchronic mapping is not sufficient to enable communities to work effectively through time. In addition to the present, communities need knowledge of their past - a diachronic mapping of what went before. These mappings provide contextual frameworks against which current and past events can be understood. They provide places where meanings can be explored and reasons discovered. Whether it is managing radioactive waste or dealing with the consequences of out-of-home care, communities need access to resilient and reliable information about their past. This paper explores the necessary conditions for building web-based long-lasting public knowledge places.

#### **Keywords**

Contextual information management; Public knowledge; Public domain; Authority control; Authority files; Context control

### **Mapeando o passado: Construindo espaços públicos de conhecimento para satisfazer as demandas da comunidade**

#### **Resumo**

As tecnologias contemporâneas da Internet têm permitido que rios de informação cheguem até a porta das nossas casas. Muita dessa informação documenta o aqui e agora, e a maioria desaparece sem deixar rastros. Ela atende à nossa necessidade de notícias e pode ajudar a que muitas pessoas se sintam conectadas ao mundo em que vivem. Esse conhecimento do presente também sincroniza comunidades e cria redes de relacionamento que são críticas para a eficácia funcional e operacional. No entanto, se diz, esse mapeamento sincrônico não é suficiente para permitir que as comunidades operem efetivamente no decorrer do tempo. Além do presente, as comunidades também precisam conhecimento de seu passado – um mapeamento diacrônico do que já foi. Esses mapeamentos fornecem molduras contextuais para a compreensão dos acontecimentos presentes e passados. Eles fornecem espaços onde se pode explorar sentidos e se pode descobrir razões. Trate-se do lixo radiativo, ou de se lidar com as consequências da criação fora do lar, as comunidades precisam de informação flexível e confiável acerca de seu próprio passado. Este artigo explora as condições necessárias para construir espaços públicos e duradouros de conhecimento na Internet.

#### **Palavras-chave**

Administração contextualizada da informação; Conhecimento público; Espaço público; Controle da autoridade; Arquivos da autoridade; Controle do contexto

## Mapping the past: Building public knowledge places to meet community needs

### Introduction

In the current world the public domain, the location of public knowledge spaces, tends to be defined by its relationship to intellectual property. James Boyle in his 2008 book *The Public Domain: Enclosing the Commons of the Mind*,<sup>1</sup> while focusing on the often negative relationship between intellectual property legislation and the public domain, draws on significant historical depth, from Jefferson to the present, to tease out the complexities and intricacies of what the public domain might actually be: “The general rule of law is, that the noblest of human productions – knowledge, truths ascertained, conceptions and ideas – become after voluntary communication to others, free as the air to common use”<sup>2</sup>.

This public domain or knowledge commons has always played a critical role in enabling communities to function effectively. This is surely a self-evident truism. It is impossible for individuals to exist in a world completely isolated from the rest of humanity. The public domain is that space where we interact with others. In taking a lead from physics,<sup>3</sup> it is possible to conceive of the public domain occupying two primary dimensions: physical spaces and their highly intertwined, contextually contingent, information counterparts.

As a simple and immediate mental exercise, examine the physical surrounds in which you are reading this article – you are in some form of shared public space (in the sense that there is no meaningful notion of a totally private physical space, just varying degrees of public sharing). Now start taking in the many and various forms in which information is being transmitted for your consumption. Leaving aside all the other senses, just focus on the textual messages. What background knowledge did you need to make sense of them? To what extent has your acculturation and prior experiences enabled you to engage in sense-making? If you are comfortable in this space, then you are effectively an insider, you have enough prior knowledge to understand this space. Imagine yourself transported into an environment where the language is incomprehensible, where the semiotics remains obscured and the culture unfathomable. You are an outsider and effective participation is much more challenging. This exercise does not just reveal a somewhat philosophically frightening array of recursive contingencies that underpin our knowing but points us to an information framework – a mapping of nodes and relationships - where we can think about how to utilize the essential and consequential historic depth of the public domain.

The introduction of the web into our world has changed many things. The ubiquitous availability of vast amounts of information about the here and now – information that is only tenuously connected to physical spaces – is changing the nature of the public domain and the way we live and work in communities. Communities are now not just sets of people brought together through various physical

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<sup>1</sup> J. Boyle, *The Public Domain: Enclosing the Commons of the Mind* (New Haven: Yale University Press, 2008).

<sup>2</sup> *Ibid.*, xv. *International News Services v. Associated Press*, 248 U.S. 215, 250 (1918) (J. Brandeis, dissenting); Y. Benkler, “Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain,” *New York University Law Review* 74 (1999): 354-446.

<sup>3</sup> H. C. von Baeyer, *Information: The New Language of Science* (London: Weidenfeld and Nicolson, 2003).

contingencies (families, work, memberships of sports clubs, music groups, hardship, hobbies etc.). They can now form in information spaces created through digital and network technologies.

While the new technologies provide opportunities to do things that were difficult, if not impossible in the past, they also present a new range of challenges. As individuals negotiating this ever-changing and ever-new space, we still need to traverse that insider/outsider boundary to create a sense of inclusion. How well a community communicates the prior knowledge necessary for effective belonging has a direct bearing on how easy it is to both understand the community, and if you chose, to join it.

Everyday anecdotal experiences of the web information world reinforces its preoccupation with information about the present (the presentation of the current) and a general reluctance to provide well-structured and navigable information about the past – the contexts we need to create meaning. Wikipedia,<sup>4</sup> and its offshoots and imitators, at first glance appears to be the exception to this generalization. However, the informatics and the way the wiki technologies are used do not fully support this contention. Entries in a monolithic online encyclopedia, like Wikipedia, may have a number of desirable characteristics useful for mapping the past, but there is limited ability or encouragement to establish entries as historically sound and evidenced-based anchor points. Consequently, the endeavor shows signs of becoming a mix of shallow, ever-changing sets of articles that only view the world from the present, and articles, neglected and ignored, relics of past views. While this is of itself an interesting global experiment in community informatics, it is the mega-search engines, attempting to make indexable web information discoverable, that are profoundly transforming the public domain.

In a public knowledge domain flooded with content, context plays an increasingly important role in helping users determine meaning and sense. In the Netherlands there has been a concerted study of context-oriented information systems and services to enable the emergence of effective electronic governance (e-government). Pieter Wisse in his benchmark 2001 book *Metapattern: Context and Time in Information Models* laid the groundwork for a decade of conceptual thinking that was in effect trying to revolutionize how we think about information systems and how we build them.<sup>5</sup>

It was noted that the systematic management and utilization of contextual information (information that can be used to create context) draws on relational theory, network theory as well as object and aspect oriented approaches. This work led to the creation of “Forum Standaardisatie” by the Dutch Minister of Economic Affairs on 27 March 2006, with the express intention of not just improving information interoperability between government agencies but between government and citizens and companies.<sup>6</sup> It was noted that if basic information registers do not sufficiently support the semantic interoperability and, consequently, the re-use of data (or knowledge), an important premise for improving services and alleviating the administrative burden, is endangered. Interestingly, as the reports of this work became more institutionalized, there were fewer specific references to contextual information

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<sup>4</sup> “Welcome to Wikipedia, the free encyclopedia that anyone can edit, 3,155,923 articles in English”. In: Wikipedia, [http://en.wikipedia.org/wiki/Main\\_Page](http://en.wikipedia.org/wiki/Main_Page) [accessed 12 January 2010].

<sup>5</sup> P. Wisse, *Metapattern: Context and Time in Information Models* (Boston: Addison-Wesley, 2001).

<sup>6</sup> Open Standaarden, Forum Standarrdisatie, <http://www.open-standaarden.nl/service/english/> [Accessed 21 January 2010].

management although, to the knowledgeable reader, contextual information management remained implicit in the statements of goals and descriptions of services.

Against this background is raised the role of digital libraries and digital archival services, especially the role of universities in the provision of knowledge services for the community. In Australia, coincident with the Dutch, there has emerged a small community, which has included the University of Melbourne and the National Library of Australia, determined to explore, through actual projects and services, the building resilient public knowledge resources based on the principles of contextual information management. There are actually few organizations in our society that have the proven track record of longevity necessary to support long-term management of public knowledge for the greater good of the community. Universities, in concert with state and national libraries and archives, are the public institutions that have the best history of stability since establishment. For example, the University of Melbourne and the State Library of Victoria were both created in the 1850s and show no signs of ceasing their existence – they are part of the core fabric of our civil society.

### Mapping the Past

The case presented here is that if governments and communities in general build resilient public knowledge spaces based on the principles of contextual information management, we create the foundations for effective transfer of knowledge for needs now as well as for communities in the future. An important and necessary corollary to this approach is that it also provides pathways to the past and the mapping of historic contexts. So what does it mean to map the past in a systematic and uniformly structured way? What does it actually mean to capture context in a way that the records of society can be situated in an information framework that will enable them to be understood not just by the people intimately associated with their creation but by others that have an interest or need? This has been a fundamental challenge of the archival community and has led to standards for archival description and management that include specific mention of context and its informatic components.<sup>7</sup>

From 1985 to the present, these standards were used to devise and publish, as a public knowledge framework, a series of interconnected information registers designed to cohere and service the history of Australian science communities. The quasi-independent registers recorded archival collections, published literature and carefully structured information about the people, places, organizations, events, concepts, ideas, subjects – that is context entities - associated with the record resources.<sup>8</sup> Each context entity, unit of archival description and registered publication was given a unique identifier within the system. This meant that it was possible to build an open system of definable relationships between all these entities in any configuration. More importantly the independence of the defined relationship

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<sup>7</sup> ISAAR(CPF): International Standard Archival Authority Record for Corporate Bodies, Persons, and Families, 2nd ed. (Paris: International Council on Archives, 2004). Online at: <http://www.ica.org/en/node/30230> [Accessed 21 January 2010].

<sup>8</sup> G.J. McCarthy, J.E. Evans, "Mapping the Socio-Technical Complexity of Australian Science: From Archival Authorities to Networks of Contextual Information." In: *Respect for Authority: Authority Control, Context Control and Archival Description*, ed. J. Dryden (Binghamton [NY]: The Haworth Information Press, 2007).

enabled the information system to lift itself above the ontological constraints of associative relationships that had become a severely limiting factor of library cataloguing systems.

Experience has shown that an ability to define relationships so they are contextually meaningful, historically valid and evidentially defensible is a powerful addition to the information management toolkit. The information architecture that emerged out of this, and similar projects, very closely matched the conceptual analysis undertaken by Pieter Wisse and his colleagues in the Netherlands. This intercontinental alignment of theory and practice was not entirely surprising, as the leading archival thinkers from the two countries have been collaborating now for about two decades.

However, the skills needed to work effectively in contextual information management are only emerging through direct practice. Although many understand the need for reliable and readily available information about the past, very few have experience or even a sense of how this might be achieved using digital networked technologies. In the corporate world not dissimilar information architectures have appeared. These systems are designed to function in closed (private) information environments and rely on centrally managed control and constraint measures to ensure ontological and semantic coherence. Mapping the past in the public domain poses a different set of challenges. It has become a major research driver of the eScholarship Research Centre, in the Library of the University of Melbourne to work on and study the creation and impact of contextually structured public knowledge information spaces. A critical partner in this endeavor has been the National Library of Australia.

### Services to the Community

In 2002 the author, then Director of the Australian Science and Technology Heritage Centre (Austehc) at the University of Melbourne, commenced a five year adventure with the International Atomic Energy Agency to study the preservation of and access to information about radioactive waste disposal facilities and their contents, for as long as they posed a threat to humanity and our environment. This was indeed the worst-case scenario that could be posed for long-term information management. The simple and immediate conclusion was that the epistemic challenge overshadowed the technological and media preservation issues.

With some simple ground rules it was possible to conceive of information media migration processes that could utilize new technologies and storage media as they appeared. What was far less clear was how meaning and sense could be maintained over time periods that could be anything from 10,000 years to 250,000 years. The role of contextual information management, in particular the idea of public domain contextual information frameworks, was posited as a means through which society and the radioactive waste industry might be able to meet these obligations.

The final report to this work, published by the International Council on Archives, attempted to articulate the conceptual foundations for the approach.<sup>9</sup> The conclusion, that each generation would have

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<sup>9</sup> G.J. McCarthy, & I. Upshall, ICA Study 18 - Radioactive Waste Information: Meeting our Obligations to Future Generations with Regard to the Safety of Waste Disposal Facilities (Paris: International Council on Archives, 2006). Online at: <http://www.ica.org/en/node/30656> [Accessed 21 January 2010]

to take some responsibility for maintaining the knowledge of the waste, was not the answer for some in the industry who were still hoping that the waste could be disposed of and then forgotten about. Although the IAEA did not publish the report itself it did use the concepts of contextual information management and frameworks to rebuild their approach to contemporary knowledge transfer between generations of nuclear engineers.

In 2004 Austehc joined in partnership with the Australian Dictionary of Biography unit at the Australian National University to create the *Australian Dictionary of Biography Online*. This project, funded by the Australian Research Council over three years, brought together the contextual information management technologies developed by Austehc<sup>10</sup> and the forty years of highly structured and community generated summary biographies of notable Australians.

This project, which achieved all that it set out to do, was launched, as a gift to the nation, by the Governor General of Australia in mid 2006.<sup>11</sup> Furthermore it brought about a subtle but significant change to the informatics of the dictionary. Whereas in the print editions all sorts of variations in the form of the articles for shared and family-grouped entries were created in the interests of saving print space, in the online edition each person was given their own unique identifier and therefore their own page in the web output. Thus it became possible to map specific relationships between people, archival resources and publications referred to in the dictionary and to imagine a future where this data could be included in an authoritative online encyclopedia of Australia.

However, the immediate consequence of web publication was the creation of a highly structured public knowledge space that was freely available not just to Australians, but to anyone with access to the web anywhere. Every person with an entry in the ADB Online was now a node in a public knowledge environment and a whole lot of doors opened as to how that knowledge might be transferred and utilized.

Also during this same period, the National Library of Australia was quietly working on developing a systematic information harvesting service that could utilize highly structured and standardized information resources such as the ADB Online to enhance the information services they offered to the community. The People Australia project, as it became known, was built around a philosophy of open knowledge sharing and the creation of national information infrastructure through the systemic interconnection of authoritative information resources.<sup>12</sup> However, the boundary objects or interconnection points were not to be publications or archival collections but context entities, in the first instance, historic people.

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<sup>10</sup> J.E. Evans, G.J. McCarthy, et al, Online Heritage Resource Manager (OHRM) (Melbourne: eScholarship Research Centre, The University of Melbourne, 2007). Online at <http://www.esrc.unimelb.edu.au/ohrm/index.html> [Accessed 21 January 2010]

<sup>11</sup> Australian Dictionary of Biography Online (Canberra: Australian National University, 2006). <http://adbonline.anu.edu.au/> [Accessed 21 January 2010]

<sup>12</sup> People Australia (Canberra: National Library of Australia, 2008): <http://www.nla.gov.au/initiatives/peopleaustralia/> [Accessed 21 January 2010].

In late 2008, the National Library of Australia and the eScholarship Research Centre, utilizing the data collected over an eight-year period in the *Australian Women's Register*<sup>13</sup> exchanged rich and highly structured information using the Encoded Archival Context XML<sup>14</sup> schema and the Open Archive Initiative – Protocol for Metadata Harvesting.<sup>15</sup> Although still in testing and development, the successes of the trials indicate it is possible to interconnect separate information systems in an open knowledge environment in a systematic and resilient manner. The flow on consequences of this breakthrough transcended the ontological and semantic roadblocks faced by information systems that have not incorporated the systematic management of contextual information - the same issue confronting Pieter Wisse and his colleagues in the Netherlands.

In 2009, the eScholarship Research Centre commenced an Australian Research Council funded project with the University of Melbourne, Department of Social Work and a large consortium of out of home-care providers in Victoria. An important, indeed critical component of the project was the creation of a public knowledge space that mapped the history of out-of-home care in Victoria covering the colonial period through to the present.

Using the Online Heritage Resource Manager, we were able to quickly establish a context entity structure and begin the study and registration of archival collections and other public domain sources that we could use to populate the space. The first edition of the service, *Pathways: Historical Resources for People Who Experienced Out of Home "care" in Victoria*, was launched in December 2009.<sup>16</sup> This is a service that is very specifically geared to people who had experienced out-of-home care at some point in their life and are trying to piece together their life story from that period. So often it is a period of disruption and trauma and the usual means through which family knowledge is preserved disappear. Consequently there is a much higher reliance on public archives and records and other public domain sources.

The reality has been that these are so fragmented that they are virtually unusable for all but the most persistent. However, this is a public knowledge space that is trying to be welcoming, unthreatening and useful. It is a common place that hopefully will help people, at their own speed, gain the prior knowledge they need to find their own path to the information they are seeking about their own life or the life of family or loved ones. Again, as the Dutch identified it is that place that builds bridges between the citizenry and the bureaucracy, which reduces administrative burden but more importantly allows a civil society to find a means through which it can right the wrongs of the past.

<sup>13</sup> "The Australian Women's Register." National Foundation for Australian Women, and the University of Melbourne (2009), <http://www.womenaustralia.info/> [Accessed 21 January 2010]

<sup>14</sup> "Encoded Archival Context: Corporate Bodies, Persons, and Families (EAC-CPF)." Society of American Archivists and Staatsbibliothek zu Berlin (2009), <http://eac.staatsbibliothek-berlin.de/> [Accessed 21 January 2010]

<sup>15</sup> "Open Archives Initiative Protocol for Metadata Harvesting." Open Archives Initiative, USA (no date), <http://www.openarchives.org/pmh/> [Accessed 21 January 2010]

<sup>16</sup> "Pathways: Historical Resources for People Who Experienced Out of Home 'Care' in Victoria", The University of Melbourne and the 'Who Am I?' Project, Melbourne (2009) <http://www.pathwaysvictoria.info/index.html> [Accessed 21 January 2010]

## Conclusions

Jono Bacon, in the *The Art of Community*,<sup>17</sup> stresses the roles and importance of governance for creating effective, enduring, open, online communities. His experience is with online communities getting together to work on open source computer software development projects, but his point is well made, although he does not reflect at all on the role of enduring information infrastructures required to meet the needs of any sort of community that would like to exist through deeper time. He neatly identifies governance as critical to maintenance of community (in a synchronic sense), to which we add the diachronic or through time dimension and extend this to cover the information infrastructure that supports a community over whatever time may be necessary.

All of the projects mentioned above demonstrate the informatic feasibility of building public knowledge spaces based on standardized contextual information management tools, but all face the same challenge in relation to their long-term maintenance and viability. As indicated earlier, universities and state-based libraries and archives will have a critical role in working with these communities to enable these services to find a resilient form. The capabilities of digital libraries and digital archives will have to be extended to include services beyond preserving discrete objects. They will also have a role in creating and maintaining contextual information frameworks that will allow those objects to be meaningfully understood both now and into the deep future. The National Library of Australia has set an example of how this might be achieved.

For many children of the digital age, their sense of history dates only to the start of the digital age at best, whereas *Pathways* has indicated very dramatically, information needs transcend technologies. Looking to the future, we must see ourselves as setting up the information infrastructure for the rest of this century, we need to start looking beyond the next technology innovation quick fix and clearly understand the barriers and interconnections between the technology layer, the content layer and the presentation layer – all of which need to be able to evolve and change at their own rates with as few dependencies as possible.

As Christine Borgman noted “What is clear at this stage is that information is more crucial to scholarship [communities] than is infrastructure per se. The content will outlive any technical architecture”<sup>18</sup>.

If we can achieve that goal, then we will have effectively done the ground work that will enable knowledge that is valuable to society to live on into the foreseeable future. We might then be able to meet our obligations to those that need knowledge of our radioactive waste sometime in the next 1000 generations or so.

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17 J. Bacon, *The Art of Community: Building the New Age of Participation* (Sebastopol [CA]: O’Reilly, 2009).

18 C.L. Borgman, *Scholarship in the Digital Age: Information, Infrastructure and the Internet* (Cambridge [MA]: The MIT Press, 2007), 227

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