

## Building an Infrastructure for Archival Research

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**Abstract.** This article chronicles the rapid expansion since 1990 of research within archival science and characterizes contemporary archival research culture. It examines the role and state of key factors that have led to the development of the existing research infrastructure, such as growth in doctoral education, forums for presenting and publishing research, the numbers and size of graduate archival education programs, availability of diverse funding for research, transdisciplinary and international research collaborations, and application of innovative research methods and tools appropriate for investigating increasingly complex and wide-ranging research questions. An Appendix articulates and names archival research methods, including those derived and adapted from other disciplines, with a view to adding to the “literary warrant” for archival research methods, promoting the rigorous application of research design and methods, and providing sources for the teaching of research methods for professional and research careers. The article concludes with recommendations about how to sustain and extend the emerging research front.

**Keywords:** archival research culture, research paradigms, research design, research methods

### Introduction

Research plays an indispensable role in ensuring the growth and general well-being of any field. It builds theories and models that provide frameworks for practice, as well as explain and describe the contexts within which practice operates. It develops the field’s knowledge base and skills, and leads to a heightened understanding of its ethos and societal roles and how these have evolved over time. It promotes critical enquiry and analysis, as well as reflection upon and evaluation of the theories, literature and practices of the field and their development over time. This results in increased rigour and sophistication in how the field’s central precepts and practices are conceptualized and articulated. Research also helps to facilitate standardization, planning and assessment by identifying and building benchmark data within and across research areas, institutional settings, and local and national jurisdictions.

In this article we characterize contemporary archival research culture<sup>1</sup> and explore emergent research infrastructures in terms of the research paradigms, designs, methods and techniques being employed. Specifically, the article identifies factors that have led to the development of this research culture. It then articulates and names archival research methods, including those derived and adapted from other disciplines with a view to adding to the “literary warrant” for archival research methods, promoting the rigorous application of research design and methods, and providing sources for the teaching of research methods for professional and research careers.

### Characterizing Contemporary Archival Research Culture<sup>2</sup>

The past 15 years have seen unprecedented growth in the development of an archival research consciousness in the academy and in practice, as well as in scholarly awareness that the construct of *the archive*, and *recordkeeping* more generally, provides a rich locus for research and theorising. What has resulted is an unparalleled diversity of what is being studied and how.

In an article first published in 1998, Carole Couture and Daniel Ducharme analysed archival literature written in English and French between 1988 and 1998 *that reflected upon the status of various fields of research in archival science* (rather than literature reporting upon research being conducted). Couture and Ducharme drew upon 38 texts in order to develop a typology of research in the fields of archival science. The article also includes several typologies of research areas within the field of managing electronic records. Couture and Ducharme’s typology is included in Table I.<sup>3</sup>

<sup>1</sup> This paper uses the term ‘archival’ throughout to include *all* aspects of archival science – as more traditionally understood through the life cycle model, as well as all aspects of the creation, management, use, and social embeddedness of records that are delineated in the records continuum model. The concept of archival research is similarly broadly construed and also includes research on archival and recordkeeping topics being undertaken by researchers in ancillary fields.

<sup>2</sup> This section of the article draws on papers presented at the Asian Pacific Conference on Archival Educators at Renmin University, Beijing, in April 2004 (by Gilliland-Swetland), and at the Recordkeeping Educators and Trainers Forum, Australian Society of Archivists Annual Conference, Sydney, in August 2002 (by Gilliland-Swetland and McKemmish), and published in Anne Gilliland-Swetland, “Building the Research Front in Archival Studies”, *Shangxi Archives* 3 (2004): 12–16. The examples provided in this section are mainly drawn from North America and Australia as the authors are more familiar with developments in these areas.

<sup>3</sup> Couture, C. and Ducharme, D., “Research in Archival Science: A Status Report”, *Archivaria* 59 (Spring 2005): 41–67.

Table I. Typology of Research Fields in Archival Science, 1988-98 (Couture and Ducharme)

Research field	Content description
1. The object and aim of archival science	<ul style="list-style-type: none"> <li>•Archives as object (information/document/record)</li> <li>•Goal: preservation, access, administrative efficiency, etc.</li> <li>•Usefulness of archives</li> </ul>
2. Archives and society	<ul style="list-style-type: none"> <li>•Role and place of archival science in society</li> <li>•Archival science as a discipline</li> <li>•Archival science as a profession</li> </ul>
3. The history of archives and of archival science	<ul style="list-style-type: none"> <li>•History of archives</li> <li>•Development of the principles and foundations of archival science</li> </ul>
4. Archival functions	<ul style="list-style-type: none"> <li>•Record creation, appraisal, acquisition, arrangement, description, preservation, accessibility</li> </ul>
5. The management of archival programs and services	<ul style="list-style-type: none"> <li>•Theory and practice of organizations</li> <li>•Program planning and evaluation</li> <li>•Management, marketing and public relations</li> </ul>
6. Technology	<ul style="list-style-type: none"> <li>•Information science as pertaining to archives</li> <li>•Information, telecommunication, and network systems</li> </ul>
7. Types of media and archives: electronic records	<ul style="list-style-type: none"> <li>•Audiovisual, electronic, iconographic, and textual archives</li> <li>•Microforms and other media or types of archives</li> </ul>
8. Archival environments	<ul style="list-style-type: none"> <li>•Government institutions</li> <li>•Teaching and research institutions</li> <li>•Religious institutions</li> <li>•Other institutions</li> </ul>
9. Specific issues related to archives	<ul style="list-style-type: none"> <li>•Ethics</li> <li>•Access to information and privacy</li> <li>•Others</li> </ul>

The following, non-exhaustive list of major and emergent areas of archival research is derived from an examination and categorization of literature *reporting on archival research* over the past decade (see Table II). This list, while it captures under different rubrics many of the same research fields and content identified by Couture and Ducharme, illustrates how broad as well as granular archival research engagement has become. Moreover, if we consider that most of these areas can be approached on at least three levels – *building*, *evaluating*, and *reflecting upon* – the potential range of research engagement is truly extensive.

*Table II.* Identification of Major and Emergent Areas of Archival Research Engagement, 1995–2005 (Gilliland and McKemmish)

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Archival education
Archival history
Archival media
Archival practice
Archival research methods and techniques
Archival systems
Archival theory, ideas and concepts
Archival tools and technology
Archival use and usability (by specific user groups)
Archives and recordkeeping metadata
Archives and recordkeeping policy
Development of descriptive models and schemas
Electronic recordkeeping
Ethnography of archival collaboration
Ethnography of archival practice
Ethnography of the archive
Impact on the record of organizational and technological change and vice versa
Psychology and ethnology of recordkeeping and use, including socialization into document creation and use
Sociology and politics of the record and recordkeeping

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Although the breadth and innovation of this research is very exciting, there is scope for more depth, and especially a need for research that builds upon existing studies, and, as appropriate, develops and revisits benchmark or comparative data. The field too often relies upon a single study of a particular phenomenon without encouraging additional studies that might provide alternative or supporting data, or consolidating what has already been discovered by pooling research efforts, e.g. through the formation of “clusters” of or forums for researchers engaged in similar types of research.<sup>4</sup> When we add to this landscape the dynamic of archival globalization as manifested through the development and application of international standards and archival and recordkeeping law and policy, increasing trans-national and trans-jurisdictional research collaborations, and a heightened concern for addressing the needs of the subaltern, several additional topics stand out as

<sup>4</sup> Examples of two areas where attempts have been made to bring together researchers working in the same area to create such clusters are recordkeeping metadata (The Recordkeeping Metadata Forum) and archival user studies (Ax-Snet).

Table III. Emergent Areas of Research Related to Archival Globalization

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Exploration of ways to diversify the archival paradigm and understand associated power and empowerment issues
Assessment of the impact of global research and international standards emanating from research upon local archival traditions and theory, as well as marginalized communities
Post-colonial issues: "the West vs. the Rest"
Evaluation, comparison and potential reconciliation of conflicting conceptual models and descriptive schema
Records law and policy, including reconciliation of different juridical traditions
Ontological, semantic, and ethno-methodological issues relating to developing understanding of emergent media forms
Addressing terminological difference within the archival field and between it and other fields interested in some of the same issues

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emergent areas of research (see Table III). Unifying themes in these emergent areas are the desire to look at issues that move beyond the local – that span organizational, disciplinary, cultural, or national boundaries; and also to examine the impact that colonization, whether it be political, cultural, theoretical, or practice-based, has upon different communities and constituencies.<sup>5</sup>

As Tables II and III suggest, archival research is increasingly addressing not only the professional and managerial aspects of archival practice, but also disciplinary aspects such as studying and theorizing the record, the archive and the archives within their organizational, social, historical, cultural and information management contexts. Relative to the latter case, we can observe that over the same period, the objects of interest to archival research, namely records, records creation and other business processes, the archive and the archives, governance, memory, identity construction, authority, authenticity, and preservation have also increasingly engaged scholars in other fields who approach them using a range of alternate epistemologies.<sup>6</sup> In developing the archival research front, which has increasingly encompassed the broader perspectives on recordkeeping

<sup>5</sup> For further discussion on this topic, see McKemmish, S., Gilliland, A. and Ketelaar, E., "'Communities of Memory': Pluralising Archival Research and Education Agendas", *Archives and Manuscripts* 33 (2005): 146-175; and papers from ICHORA2 which will be published in a forthcoming issue of *Archival Science*.

<sup>6</sup> For example, see the two recent issues of *History of the Human Sciences* on "The Archive".

espoused by continuum thinking, it is important to be inclusive of all of these aspects. The field needs research that draws upon, builds, and understands the shifting symbioses between the applied and the theoretical. The field also needs to establish a firm foothold within the academy by demonstrating that the discipline, as well as the practice, brings to bear identifiable, distinctive and rigorous perspectives and toolsets of methods and techniques.

There are several other factors that attest to the growth of archival research between 1990 and today. These include the engagement of archival scholars around the world in building new theories and models; the increasing number of doctoral programs, and the growth in numbers of recent graduates of these programs who are now employed in academic and other research positions; the increasing number of full-time academics who are teaching and conducting archival research; the growth in demand for research in practice; the increased availability of external funding for archival research as well as investment, sponsorship and engagement by archival institutions, archives and records programs, and professional and user communities; the inception of collaborative multidisciplinary national and international archival research projects involving academics and practitioners; the increasing numbers of research projects in other disciplines that incorporate an archival component; the increasing number of journals publishing archival research; and the enhancement of existing, and development of new archival research designs, methodologies and techniques. The following sections examine these factors in more depth.

### *Development of new theories and models*

Although the archival literature has been replete for many decades with expository and discursive writings on the nature of archival theory and how it can or cannot be distinguished from praxis, little critical attention has been paid until recently to how archival theory has been, or should be built. A cadre of international archival scholars such as Upward, Cook, Nesmith, Brothman, Ketelaar and Harris, influenced by philosophers such as Foucault and Derrida as well as by local and national social and political events and movements, have been engaged, since the early 1990s, in re-thinking and debating the theories and models around which archival practice has been centred

for most of the Twentieth Century.<sup>7</sup> Arguably such intellectual ferment has occurred at other points in modern archival history, most notably around the historical articulation and adoption of the principles of *respect des fonds* and *provenance*,<sup>8</sup> and the manifold re-examinations of appraisal theory in the 1980s and early 1990s in response to Hans Boom's reflections on the role and conduct of appraisal in light of communism, the rise of social history and the proliferation of records created through new technologies.<sup>9</sup> However, until recently, there has not been the conscious theory-building that is evidenced in the recent work of archival scholars. Theory-building, as a research method, is a means by which the logic that is used to build the theory is made explicit and accessible to the user of the resulting theory.<sup>10</sup> Upward's work, and his Records Continuum Model in particular, provide probably the best extant example of contemporary theory-building. The records continuum has not only been extensively explicated in his own writings, but it has become the conceptual basis of record-keeping practice, standards and law in Australia, as well as being used as a model within which current research can be situated and by which ongoing research needs can be identified. Other recent, although less extensive, contributions to theory and model-building include Trevor Livelton's work on archival theory, records and the public, Martine

<sup>7</sup> See, for example, Upward, F., "Structuring the Records Continuum Part One: Post-custodial Principles and Properties", *Archives and Manuscripts* 24(2) (Nov 1996): 268-285; and "Structuring the Records Continuum Part Two: Structuration Theory and Recordkeeping", *Archives and Manuscripts* 25(1) (May 1997): 10-35; Brothman, B., "Declining Derrida: Integrity, Tensegrity and the Preservation of Archives from Deconstruction", *Archivaria* 48 (Fall 1999): 64-88; Brothman, B., "The Past that Archives Keep: Memory, History, and the Preservation of Archival Records", *Archivaria* 51 (2001): 41-80; Cook, T., "What is Past is Prologue: A History of Archival Ideas Since 1898, and the Future Paradigm Shift", *Archivaria* 43 (Spring 1997): 17-63; Cook, T., "Archival Science and Postmodernism: New Formulations for Old Concepts", *Archival Science* 1(1): 3-24; Cook, T., "Archival Jazz: Verne Harris and the Rhythm of Memory", in E. Kriger (ed.), *A 'Festschrift' Celebrating the Ongoing Life-Work of Verne Harris* (Pretoria: National Archives of South Africa, 2001), xi-xxi; Hamilton, C., Harris, V., et al. (eds.), *Refiguring the Archive* (Dordrecht: Kluwer Academic Publishers, 2002); Ketelaar, E., "Archivalisation and Archiving", *Archives and Manuscripts* 27 (1999): 54-61; Ketelaar, E., "Archivist Research Saving the Profession", *The American Archivist* 63 (2000): 322-340; Nesmith, T., "Still Fuzzy, But More Accurate: Some Thoughts on the 'Ghosts' of Archival Theory", *Archivaria* 47 (Spring 1999): 136-150; Nesmith, T., "Seeing Archives: Postmodernism and the Changing Intellectual Place of Archives", *The American Archivist* (Spring/Summer 2002): 24-41.

<sup>8</sup> On the reconsideration of provenance, see, for example, Nesmith, T. (ed.), *Canadian Archival Studies and the Rediscovery of Provenance* (Metuchen, NJ: SAA and ACA, 1993).

<sup>9</sup> Booms, H., "Überlieferungsbildung: Keeping Archives as a Social and Political Activity", *Archivaria* 33 (Winter 1991-92): 25-33 and "Society and the Formation of a Documentary Heritage", *Archivaria* 24 (Summer 1987): 69-107.

<sup>10</sup> Lynham, Susan A., "The General Method of Theory-Building Research in Applied Disciplines", *Advances in Developing Human Resources* 4(3) (2002): 221-241.

Cardin's work on physical, functional and symbolic characteristics of archives,<sup>11</sup> and Karen Gracy's research, discussed in her article in this issue, that adapts Bourdieu's model of cultural reproduction as a framework for assessing notions of preservation value.<sup>12</sup>

*Emergence of archival PhD and research programs in universities*

In some places in the world, such as the United States and Europe, there have long been archivists who have held doctoral degrees. For the most part, these archivists received their degrees in fields such as history with the goal of pursuing an academic career in that field, or else, although often a second choice, using the degree to obtain entrée into the archival field where there was no other terminal professional degree in place. However, the doctoral coursework and dissertations of such individuals did not focus specifically on research questions integral to archival science. From the early 1990s, an increasing number of archival students and professionals have pursued doctoral degrees with the specific goal of undertaking archival research. This movement coincided with some other factors that made pursuing a research education more desirable. Firstly, for those wishing to have a career as an "archival academic", a PhD has become a necessity in many major universities around the world. This factor has also led some archival faculty members who did not have a doctoral degree to decide that they must obtain one. Moreover, many of these individuals wanted to have a degree in the archival field in which they wished to work and not an ancillary field such as history or library science. Secondly, there has been a rapid increase in the numbers of universities seeking to develop or expand their archival education programs, and for this they need individuals with doctoral degrees who are qualified to teach and conduct research in this area. Thirdly, to be able to achieve tenure as an academic, archival science faculty members must conduct substantive research that passes peer review. Finally, recognizing the potential for growth in faculty and other research positions, several major universities that offer professional education in archives and records began over the past decade also to develop doctoral focuses in the area (for example, Monash University from 1990, Renmin University from 1994, and the University of California, Los Angeles from 1995).

<sup>11</sup> See Livelton, T., *Archival Theory, Records, and the Public* (Lanham, MD: Society of American Archivists and Scarecrow, 1996) and Cardin, M., "Archives in 3D", *Archivaria* 51 (Spring 2001): 112-136.

<sup>12</sup> See Gracy, K., "Documenting Communities of Practice: Making the Case for Archival Ethnography", *Archival Science* (this issue) and *The Imperative to Preserve: Competing Definitions of Value in the World of Film Preservation*, Ph.D. Dissertation (Los Angeles: University of California, 2001).



With the rising numbers of recent doctoral graduates, we can correlate not only an increasing level of rigorous research that is being disseminated through conferences and scholarly publications, but also a growing diversity of research topics examined and methods applied, and a growing number of scholarly outlets for that research. The diversity in the research has the additional benefit of multiplying the perspectives to which students in multi-faculty archival education and research programs are exposed. While this is a very exciting time for archival academics, we cannot afford to become too complacent about this state of affairs. For example, while more archival programs are currently seeking to hire new faculty, few qualified candidates are available as yet. What is more, in the next decade, many of these programs will be faced with the retirement of their lead faculty members. The investment in creating new PhDs can be anywhere from 3 to 10 years and there is no guarantee that a new doctoral graduate will want to go into academia, rather than into some other area of research or into practice. This state of affairs places a heavy onus, therefore, on those universities that offer archival doctoral programs to recruit and graduate increased numbers of doctoral students. This, in turn, requires that those universities can also provide sufficient incentives to attract and retain potential students, such as scholarships and research opportunities.

*Growth in demand for research in practice, increasing availability of external funding and industry support for archival research and investment by archival institutions and associations*

Availability of funding is a critical piece of infrastructure for nurturing sustained and purposeful research in any area. One phenomenon to which we can point in North America, Europe and Australia in the past 15 years that has supported the growth of an archival research front has been the availability of unprecedented levels of external funding for archival research, in particular for research that relates to electronic records or automated archival information systems. Although the preponderance of direct funding has been made available by US, Canadian, European and Australian government research bodies, the willingness of archival institutions, records programs, private foundations and professional communities to sponsor and provide matching funding and in-kind resources to support these projects has been critical to the success of most major grants.

In a pioneering initiative in 1991, the US National Historical Publications and Records Commission (NHPRC) released a report, *Research Issues in Electronic Records*, which identified several applied research

questions and called upon the archival community to undertake research and development activities to identify strategies and solutions to those questions. While it could be argued that it is not always desirable for external funding initiatives to drive local and individual research priorities, the NHPRC report was probably the single most important factor in developing an electronic records research front in North America. It articulated research needs and set the research agenda for an NHPRC funding initiative devoted entirely to electronic records research and development, which met with extremely positive responses from leading archival institutions and records programs.

Today, electronic records research, with its increasingly empirical approach, emphasis on theory-building, and growing convergence with the research interests of digital libraries, digital preservation, and metadata development communities, has arguably outgrown this applied agenda. However, much of the seminal research in the US in the field of electronic records for over a decade, including the Pittsburgh, Indiana University, InterPARES and the Archivists' Workbench electronic records projects, was conducted under the rubric of the NHPRC research agenda.<sup>13</sup> Similarly, in Canada, the Social Sciences and Humanities Research Council (SSHRC) has supported the UBC Project (with significant input from the US Department of Defense) and the InterPARES 1 and 2 Projects (which also included major sponsorship from national archival institutions and other professional associations, consortia, and smaller repositories worldwide) to the tune of several million dollars. In Australia, the Australian Research Council has funded major collaborative research on recordkeeping metadata, Indigenous archives, and preservation with matching inputs from national and state archival institutions and professional associations, and supported the work of the groundbreaking Australian Science and Technology Heritage Centre. And in recent years, the National Science Foundation in the United States has held several agenda-setting workshops that relate to archival concerns, especially the preservation of digital materials, and has also contributed substantial funds to research initiatives in these areas.

During the same period a number of archival institutions have taken their own research and development initiatives in the electronic records area, for example the State of New York Archives and Records Administration, the National Archives of Canada and Australia, the State Records Authority of NSW and the Public Record Offices of the UK and Victoria. The latter engaged a team of research consultants from the

<sup>13</sup> The NHPRC agenda itself has recently been re-evaluated in terms of directing it more toward translating research into practice through such activities as building model programs and education.

leading scientific research body in Australia, the Commonwealth Science and Industry Research Organisation, CSIRO, to assist in the development of VERS, the Victorian Electronic Records Strategy.<sup>14</sup>

Although the urgency and complexity of the challenges presented by electronic records have undoubtedly wielded unprecedented influence over the availability of research funding and, by implication, the concentration of so much research in this area, there is a growing demand for research to be applied to all areas of practice. This demand is evidenced by the range of research and development initiatives based in archival institutions and records programs, and the willingness of archival institutions, records programs, and professional and user communities to support and sponsor collaborative research projects. Such research is considered necessary to ensure, among other things, that archival practice is effective and efficient, that robust and accountable benchmarks and standards are developed for different areas of practice, that user, documentary, and media needs are understood and addressed, and that the challenges and opportunities of new technologies are addressed and optimized.<sup>15</sup>

The professionals involved in both institution-based research and development initiatives and collaborative research projects of the kind described above will not generally be those who have graduated from doctoral programs, but practitioners with a professional education. The implication of this statement is that there is a very significant place for research education in archival science education programs at the professional as well as the doctoral level. Future practicing archivists should be educated in how to conduct, evaluate, and read research that relates to their areas of professional activity.<sup>16</sup>

*Collaborative national and international archival research projects involving academics and practitioners*

Largely through the availability of the funding mentioned above, and related industry and community support, the past several years have seen some notable shifts in where archival research has been concentrated and how it has been conducted. For example, we have seen

<sup>14</sup> For a more detailed review of research developments in electronic recordkeeping, see Gilliland-Swetland, A., "Management of Electronic Records", *Annual Review of Information Science and Technology (ARIST)* 39 (2005): 219-253.

<sup>15</sup> Examples of such research include the Museums and the Online Archives of California (MOAC) Evaluation Project and many other such archival and museum projects recently funded by the U.S. Institute for Museum and Library Services.

<sup>16</sup> See Gilliland-Swetland, A., "Archival Research: A 'New' Issue for Graduate Education", *American Archivist* 63(2) (2000): 258-270.

shifts from individual to collaborative research modes; and from local or institutional to transnational and even global research. We have also seen a more conscious bridging of academia and practice and of basic and applied research. One of the most prominent illustrations of these shifts has been the University of British Columbia-based InterPARES Project (International research on Permanent Authentic Records in Electronic Systems) that includes multidisciplinary researchers from academia, archival institutions and industry in at least 14 different countries. Another example is the European digital preservation project ERPanet, involving collaboration between a range of universities and archival institutions. The Clever Recordkeeping Metadata Project is a Monash University-based collaboration of academics in Australia and the United States, the National Archives of Australia, the State Records Authority of New South Wales, the Descriptive Standards Committee of the Australian Society of Archivists, and an advisory group drawn from industry and international experts. The project is developing a proof of concept prototype to demonstrate how standards-compliant metadata can be *created once* in particular application environments then *used many times* for multiple purposes across business applications and in different environments.

Many of these projects are closely linked with professional, national and international policy making and standard setting initiatives, for example the links between the UBC project and the US Department of Defense records management application standard, the recordkeeping metadata research in Australia and the development of a national recordkeeping metadata schema, and the InterPARES research and the international standard on records management metadata.<sup>17</sup>

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<sup>17</sup> For further information on these projects and their relationships to standards development see Duranti, L., Eastwood, T. and MacNeil, H., *Preservation of the Integrity of Electronic Records* (Dordrecht: Kluwer Academic Publishing, 2002); Evans, J., McKemmish, S. and Bhoday, K., "Create Once, Use Many Times: The Clever Use of Recordkeeping Metadata for Multiple Archival Purposes", *Archival Science* (forthcoming); Gilliland, A., Rouche, N., Evans, J. and Lindberg, L., "Towards a Twenty-First Century Metadata Infrastructure Supporting the Creation, Preservation and Use of Trustworthy Records: Developing the InterPARES2 Metadata Schema Registry", *Archival Science* (forthcoming); Gilliland-Swetland, A. and McKemmish, S., "A Metadata Schema Registry for the Registration and Analysis of Recordkeeping and Preservation Metadata", in *Proceedings of the Second IS&T Archiving Conference, April 26-29, 2005, Washington, D.C.* (Springfield, VA: Society for Imaging Science and Technology, 2005), pp. 109-112; International Standards Organisation (2004) AS ISO 23081: *Information and Documentation – Records Management Processes – Metadata for Records, Part 1: Principles*, 2004. See also the following websites: Clever Recordkeeping Metadata Project <http://www.sims.monash.edu.au/research/rcrg/research/crm/>; InterPARES 1 and 2 Projects <http://www.interpares.org>; U.S. Department of Defense 5015.2-STD, "Design Criteria Standard for Electronic Records Management Software Applications", 06/19/2002 <http://www.dtic.mil/whs/directives/corres/html/50152std.htm>.

*Increasing numbers of research projects in other disciplines that incorporate an archival component*

All of the projects and initiatives already mentioned are directed by and for those in the archival field, although many of them have brought in researchers from other disciplines and fields to help address the increasingly complex research questions that are now being investigated. Indeed, hallmarks of contemporary archival research include its increasing trans-disciplinarity, complexity, and sophistication. However, another important aspect of the emerging research culture, consciousness and efforts is the participation of archival researchers in projects that are being directed by those in other fields. Issues with which archivists have long been concerned, such as description of non-bibliographic resources, the nature of evidence, and preservation of non-book objects such as scientific data and cultural and creative materials, concerns with the provenance and authoritativeness of information resources online, and context-driven approaches to information access and retrieval have become matters of shared concern to non-archivists. As a result, we see archival researchers increasingly becoming involved in research in other fields. This research relates to areas such as the preservation of digital objects, the building of digital libraries, digital asset management, digital government, organizational behaviour and change, resource discovery, and the use of primary sources in education. It also has the secondary benefit of allowing archival researchers to participate in the development of “big” ideas that stretch the relevance of archival concerns and that bring exposure to new and different methods for examining those issues.<sup>18</sup>

*Increasing number of forums for publishing and discussing education and research in archival studies*

A research front cannot be sustained without robust ways for researchers to exchange ideas and research findings. In the past 7 years or so, archival academics and researchers have met in several venues to talk about their research and how they are developing research education within their institutional contexts. Examples of such venues include pre-conferences before the Society of American Archivists’ annual meetings in San Diego, Pittsburgh, and Boston, the Australian Society of Archivists and the Records Management

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<sup>18</sup> See, for example, the work of Anne Gilliland on the Alexandria Digital Library Prototype Project, Margaret Hedstrom on the CEDARS Project, and Sue McKemmish on a range of Australian health portal projects.

Association of Australia; the series of education and research-themed conferences around the world over the past several years that have been sponsored by the Section on Archival Education and Training of the International Congress on Archives (ICA-SAE); and I-CHORA (International Conference on the History of Records and Archives), which was first held in Canada in 2003 and held again in the Netherlands in 2005. Perhaps one of the most telling developments, however, and already alluded to above, has been the rapid increase in the number of forums in which archival research can be published. There are several new archival journals, including *Archival Science* and the *Journal of Archival Organization*, as well as re-conceptualized journals such as the *Journal of Libraries and Culture* that specifically reach out to archival researchers. In addition, there are special issues of non-archival journals that have been dedicated to archival topics, and archival research articles that are being published in journals in many other fields such as digital libraries and information science.

The previous sections have discussed a range of indicators of the existence of, and factors that have been integral to, the rapid growth of an archival research infrastructure. The next sections address aspects that are critical to the conduct of rigorous and innovative research – a research ethos, and appropriate paradigms, designs, and tools.

### **The Developing Research Ethos**

Issues relating to the developing archival research ethos warrant more extensive discussion than is possible here. They include questions of professional and disciplinary values, and the principles, knowledge and skill sets that archival researchers need to bring to their work to ensure that it is rigorous, available for peer review and scrutiny by the public and funding bodies, and compliant with professional, institutional, and funding body requirements for ethical conduct. The trend towards collaborative, transdisciplinary and international research, and increasing concern about protecting vulnerable research populations bring new challenges in this regard.

Archival researchers who did not receive research training in a social science or science context, even those with doctoral degrees, may never have been exposed to a requirement to obtain clearance from an Institutional Review Board (IRB) or Research Ethics Committee in order to work with human subjects, or in some jurisdictions, even to work with previously gathered data. These processes typically require the submission of a detailed research protocol, data

gathering instruments, draft informed consent letters, and statements about how the privacy and non-coercion of individuals referred to in gathered data will be ensured during and after the project, as well as in any resulting publications and presentations. Obtaining such clearance can be a lengthy and iterative process, especially if the research protocol changes during the course of the research. Researchers, therefore, need to become familiar with when and how to obtain such clearance. This issue of ethics clearance becomes even more complicated when working in research projects that might involve multiple funding agencies, especially those in the private sector, multiple institutions, multiple national jurisdictions, different cultural beliefs or attitudes, and/or researchers from several disciplines.

Complex issues of intellectual property and acknowledgement of the contributions of the various parties involved also arise. Protocols need to be in place in relation to the recognition of scholarly contributions including data gathering and data analysis, especially where work is collaborative, or where archival researchers are supervising student research assistants. The support of funding bodies should also be acknowledged. Research processes need to be transparent and submitted for peer review; and detailed documentation kept of how research is conducted, how data is analysed and the results of the analysis validated.

Working with communities, particularly vulnerable communities, brings into play a range of ethical considerations including what constitutes ethical research behaviour in terms of the culture and values of the community involved, and issues relating to the ownership of data gathered during the research, access and intellectual property rights, and the appropriation of traditional knowledge through unethical research processes.

## Research Paradigms

Archival research is conducted within a number of different research paradigms. In first defining a paradigm in 1962 as a “universally recognized scientific achievement that for a time provides model problems and solutions to a community of practitioners”, Kuhn was writing in the context of the natural sciences and the notion of “normal science”.<sup>19</sup> He felt that the behavioural and social sciences

<sup>19</sup> See Kuhn, Thomas S., *The Structure of Scientific Revolutions* (Chicago: Chicago University Press, 1962), p.vii. Kuhn further defines a paradigm as “a set of interrelated assumptions about the social world which provides a philosophical and conceptual framework for the systematic study of the world,” see Kuhn, *The Structure of Scientific Revolutions*, 2nd edn. (Chicago: University of Chicago Press, 1970), p. 10.

had not yet achieved the maturation evidenced in the sciences and were, therefore, in a "pre-paradigmatic" state. Today, there is considerable debate about the paradigms at work in different research areas, as well as their degree of maturation, and, although this too is beyond the scope of this article, it is interesting to muse about what a single paradigm might look like for archival science. How would it account for the roots of the field in the humanities and subsequent interaction of that tradition with social science-based research, business-derived frameworks, and even approaches derived from scientific inquiry that are associated with electronic records research and the influence of Library and Information Science-based archival educational programs?

Perhaps clues may be drawn from the work of Richard Apostle and Boris Raymond, who have asked similar questions in the ancillary field(s) of Library and Information Science. Looking at Library and Information Science literature and education programs, as well as the emerging labour market for those with information skills outside libraries, they identified both a "library service paradigm" and an "information paradigm", although they argue that there is a blurring between the two, with the information paradigm increasingly being dominant. Apostle and Raymond characterize the library service paradigm as one that promotes the more physical aspects and traditional social and cultural roles of libraries, for example, providing childrens' and readers' advisory services, while the information paradigm separates the librarian from the physical aspects of the library and emphasizes the role of information in science, business and technology.<sup>20</sup>

A similar dichotomy could be discerned in recent archival research in the divergence between post-modern examinations of the role of the archive in society and the technological and business orientation of much of the current electronic recordkeeping research. Michael Buckland draws on Apostle and Raymond's work and argues that there are two complementary but not convergent traditions at work in Information Science – a document tradition and a computation tradition – but that "information is the basic concept upon which the paradigm rests".<sup>21</sup> These comments resonate with the tensions in Archival Science between the historical and historiographical approaches to

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<sup>20</sup> Apostle, R. and Raymond, B., *Librarianship and the Information Paradigm* (Lanham, MD: Scarecrow Press, 1997).

<sup>21</sup> See Buckland, M., "The Landscape of Information Science: ASIS at 62", *Journal of the American Society for Information Science* (1999) available from: <http://www.sims.berkeley.edu/~buckland/asis62.html>.



conceptualizing, describing and examining the record and the technologically driven approaches manifested in research relating to electronic records preservation and delivery of archival materials online.<sup>22</sup> David Ellis examined the related field of information retrieval research and argued that it focused on either people (for example, authors, indexers, intermediaries and users), what he called the cognitive paradigm, or things or artefacts (for example, documents, document representations, abstracts, and indexes), what he called the physical paradigm (in other words, broadly encompassing information-seeking and information retrieval models respectively). Ellis also argued that the duality of this focus was what hindered information retrieval from developing a stronger and more integrated paradigmatic framework.<sup>23</sup> Archival science research arguably includes both a focus on the people and on the artefacts (in this case, records, record-like objects, and their surrogates), but there is also a third focus – processes (for example, records creation, management, preservation, use).

The most dominant prevailing research paradigms in the social sciences, positivism and interpretivism, are associated with distinctive philosophical positions and theoretical frameworks relating to how knowledge and knowledge systems are defined. In turn these are related to different approaches to the discovery or construction of knowledge such as the theoretical-inductive and the empirical-deductive. Particular research methods and techniques are often associated with these different paradigms, for example positivist researchers often favour quantitative and experiment-based research methods, while interpretivists are more likely to use qualitative methods. However, many research methods and techniques are used in both paradigms, albeit applied and evaluated in different ways, as further discussed below.

The positivist research paradigm in the social sciences is predicated on the validity of transferring empirical understandings of the natural world and the methods and techniques associated with scientific inquiry to the social world. Coined by the philosopher Comte in 1830, the term positivism is associated with a view of knowledge formation that is linked to empiricism, and the notion of a reality that “can be objectively observed and experienced”. The world, whether that be the natural or social world is viewed “as a collection of observable events and facts which can be measured”, and there is a

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<sup>22</sup> For discussion of the paradigm shift in archival science, see Thomassen, T., “The Development of Archival Science and its European Dimension”, in *The Archivist and the Archival Science. Seminar for Anna Christina Ulfspärre...* (Lund, Landsarkivet, 1999), pp. 67–74.

<sup>23</sup> Ellis, D., “The Physical and Cognitive Paradigms in Information Retrieval Research”, *Journal of Documentation* 48(1) (1992): 45–64.

belief in the existence of general laws that can be discovered by systematic, scientific inquiry. The positivist research paradigm is closely associated with deductive reasoning which moves from the general to the particular, making inferences about a particular instance from a generalization, formulating hypotheses from these generalizations to be tested by the research, the collection and analysis of quantitative data, the design of replicable experiments, and the use of scientifically selected samples such as random samples. A key objective of such research is producing findings that are generalizable.<sup>24</sup>

Positivist notions about the existence of an objective reality and of "universal principles that go beyond any particular historical, legal or cultural context"<sup>25</sup> strongly influenced the practice of scientific history and diplomacy in the 19th century and continue to underpin contemporary archival diplomacy as a method of research inquiry. Examples of archival research informed by such influences include *The Protection of the Integrity of Electronic Records Project* undertaken at University of British Columbia, and the work undertaken by the Authenticity Task Force in InterPARES 1. The latter, for example, used contemporary archival diplomacy and theoretical-deductive methods to derive models of reliable and authentic electronic records in administrative and archival contexts respectively, drawing on the general principles of diplomacy relating to the essential attributes of records, as reinterpreted and extended by Duranti.<sup>26</sup> In InterPARES 1, a series of case studies were then undertaken to test the validity of the models.

The interpretivist research paradigm in the social sciences, which evolved from the intellectual tradition of hermeneutics, originally concerned with the interpretation of texts, is based on an understanding of the social world as being ever changing, constantly "interpreted or constructed by people and ... therefore different from the world of nature". From this perspective there is no one objective reality, but rather "multiple realities which are socially and individually constructed", and thus researchers in this tradition are concerned with interpreting social meanings and personal sense-making. The interpretivist research paradigm is closely associated with inductive reasoning which moves

<sup>24</sup> Williamson, K., *Research Methods for Students and Professionals: Information Management and Systems* (Wagga Wagga NSW: CSU, 2000), for discussion of the positivist research paradigm, especially Chapter 2, "The Two Traditions of Research" (Kirsty Williamson with Frada Burstein and Sue McKemmish); quotes from pp. 27–28.

<sup>25</sup> Mortensen, P., "The Place of Theory in Archival Practice", *Archivaria* 47 (Spring 1999): 1–26; quote from p. 2.

<sup>26</sup> In a series of articles published between 1989 and 1992, later published in Luciana Duranti, *Diplomatics: New Uses for an Old Science* (Lanham, Maryland, and London: Scarecrow Press in association with the Society of American Archivists and Association of Canadian Archivists, 1998).

from the particular to the general, with the research itself leading to the generation of hypotheses, the collection and analysis of qualitative data to form rich pictures of particular instances, and the use of purposive sampling. Whereas positivist approaches aim to discover generalizable knowledge that is applicable in any particular instance, interpretive approaches aim to build transferable knowledge, to develop rich pictures and in depth understandings of particular instances that can assist in understanding other instances, taking into account their particular contexts.<sup>27</sup>

The current Australian Research Council funded Linkage Project, *Trust and Technology: Building archival systems for Indigenous oral memory* is an example of archival research in the interpretivist tradition. It aims to explore the needs of Indigenous Australian communities in Victoria in relation to archival services, in particular relating to oral memory, through in-depth interviews with members of that community, as well as Indigenous users of current archival services and the mediators who work with them. It is a collaborative, multidisciplinary project involving Indigenous and non-Indigenous researchers, and industry and community partners from both Koorie and mainstream archival programs in Victoria. Although the project's main focus is on oral memory, it is hoped that its findings in relation to building trust and understanding between archival institutions and Indigenous Australian communities, will be transferable in that the understandings gained will also inform the development of models for community-centred archival services for Indigenous communities in Victoria.<sup>28</sup>

Fundamentally, as Schauder has highlighted, "the theoretical traditions of positivism and interpretivism are alternative ways of seeing". He emphasizes how important it is for researchers to be "self-aware of their theoretical positioning, and to make this explicit to all stakeholders in the research".<sup>29</sup>

Until recently much archival research did not explicitly acknowledge the research paradigm in which it was operating. It is instructive to note that the debate relating to the validity of the electronic records research undertaken in the UBC and Pittsburgh projects in the mid-1990s, although not cast in these terms, largely stemmed from a clash

<sup>27</sup> Williamson, op. cit., Chapter 2, quotes from p. 30. Some of the key writers in this field are Berger and Luckmann who explored the social construction of reality, Kelly, who was concerned with the way individuals construct their personal realities, and Dervin who theorized about "sense-making".

<sup>28</sup> Details of the Trust and Technology project are available at <http://www.sims.monash.edu.au/research/eirg/trust/>

<sup>29</sup> In Williamson, op. cit. p. 307.

of these two paradigms with UBC researchers, operating within a positivist, theoretical-deductive framework, believing that the Pittsburgh team were not engaging in systematic, rigorous research because they were relying largely on empirical-inductive approaches in an interpretative framework. The counter charge from Pittsburgh that it is not possible to derive rules for particular instances from a general set of principles is a standard interpretivist critique of positivist research in the social sciences.<sup>30</sup>

More self-conscious approaches and more rigorous research design and application of methods and techniques are apparent in more recent projects. While there is still a need for greater self-consciousness and reflection in relation to the theoretical positioning of archival research, and more robust research designs and rigorous use of appropriate methods and techniques, there is also evidence of a growing maturity in the research culture in these regards.

The broader intellectual context of the differing approaches to research described above encompasses modern and postmodern philosophical, anthropological, sociological, and historiographical thinking, including explorations of the nature of theory itself. This is clearly illustrated in the different understandings and interpretations of the record and the archive that underpin archival research influenced by the different paradigms. The interpretive paradigm encompasses a spectrum of approaches that are linked to constructivism, structuralization and critical theory with increasingly close ties to postmodernism. It has been linked to ideas about "archival science" that are akin to Geertz' belief that the goal of anthropology is to act as an "interpretive science in search of meaning, not an experimental science in search of laws".<sup>31</sup> Preben Mortensen has argued that: "when the positivist conception of science is abandoned, new forms of archival theory emerge", theory that is better understood as "reflections on or criticism of practice" that display "sensitivity to context and history".<sup>32</sup> Positivist researchers tend to espouse notions of the record and the archive associated with ideas

<sup>30</sup> These arguments and counter-arguments were made in a number of forums where papers about the projects were presented. For explanations of the methods used, see Duranti, L. and MacNeil, H., "The Protection of Electronic Records: An Overview of the UBC-MAS Research", *Archivaria* 42 (Fall 1996): 46-67, on the UBC project, and papers related to the University of Pittsburgh Functional Requirements for Recordkeeping project in Bearman, David (1994), *Electronic Evidence: Strategies for Managing Records in Contemporary Organizations* (Pittsburgh: Archives and Museum Informatics).

<sup>31</sup> The quote from Geertz (cited on p. 167 of Williamson op. cit.) comes from: Geertz, C., *The Interpretation of Cultures* (New York: Basic, 1973). In pursuing Geertz' goal, ethnographers have focused on interpreting events, communities, social groupings, and behaviours in their rich and varied Contexts.

<sup>32</sup> Mortensen, op. cit. p. 1, 20-21.

about the objective and fixed nature of records, and the impartial and neutral roles played by archivists in their preservation. By contrast, interpretivist researchers focus on the contingent nature of records, the diverse and changing contexts in which they are created, managed and used, and the formative role played by recordkeepers and archivists. Such interpretivist views are influenced also by anthropological thinking about records as cultures of documentation, and the way in which the archive, the recordkeeping and archiving processes that shape it, and the worldviews made manifest in its systems of classification, reflect the power configurations of particular times and places, and associated memory and evidence paradigms.<sup>33</sup>

Postmodern ideas about records view them as both fixed and mutable, “always in a process of becoming”, fixed in terms of content and structure, but linked to ever-broadening layers of contextual metadata that manages their meanings, and enables their accessibility and useability as they move through “spacetime”.<sup>34</sup> The archive, conceptualized as a relic, an historical artefact, fully formed and closed in the positivist tradition is seen as constantly evolving and changing shape in postmodern frameworks.

More recently “post” ways of seeing are emerging which challenge the dualism inherent in the positivism versus interpretivism, theoretical-inductive versus empirical-deductive, and quantitative versus qualitative constructs. This is leading to the blurring of some of the distinguishing characteristics of the traditions of positivism and interpretivism, for example the association of quantitative methods with positivist research and qualitative methods with interpretivist research. Thus, although still assuming that reality exists, post positivists believe it is very difficult to discover because of what Denzin and Lincoln describe as “flawed human intellectual mechanisms” and “the fundamentally intractable nature of phenomena” and they tend to use

<sup>33</sup> Stoler, A.L., “Colonial Archives and the Arts of Governance”, *Archival Science* 2 (2002): 87–109.

<sup>34</sup> For discussion of the records continuum as a “spacetime” model, see: Upward, F., “Modelling the Continuum as Paradigm Shift in Recordkeeping and Archiving Processes, and Beyond – A Personal Reflection”, July 2000 draft of *Records Management Journal* article. In this draft, Upward argues that the theoretical shift between life cycle models and continuum ones represents a true paradigm shift:

In life cycle models there is a theoretical assumption that the best approach to the management of records is a stage based one, and that the stages match recurring events in the life history of the records. The stages might be as elementary as creation, maintenance and disposition. Records endure through these stages as if each one is sharing a common, natural and recurring pattern. In the continuum approach, records continue through spacetime and the stages blur and relate to each other according to the contingencies of the situation. In the process records are stretched into new shapes and forms.

Note: This paragraph does not appear in the final version of the article.

methods and techniques more often associated with interpretivist research.<sup>35</sup> The paper by Heather MacNeil elsewhere in this issue explores the way in which the creative tension between the two paradigms is manifest in the first and second stages of the InterPARES project and speculates on how far the research may in fact be moving beyond the paradigms, for example in the triangulation of methods informed by the different philosophical positions.

The power of moving beyond the binary oppositions associated with the two paradigms is suggested by Verne Harris, referring to the global and the local/indigenous, in his paper to the International Congress on Archives Congress in Seville:

...there is extreme danger in a reason which gives no space to mystery, in the archon unchallenged by the anarchontic, in a globalising allowed to destroy the local, the indigenous. Equally there is a danger in the mystery which gives no space to reason, the anarchontic without archontic rein, in the local excluding the global. In other words, I am arguing against the binary opposition and the either/or. It is in the both/and, the holding of these apparent opposites in creative tension, that there is *liberation*. For instance, a liberation for the indigenous in being open to engagement with the dynamics of globalization. A liberation for the global in respecting the indigenous.<sup>36</sup>

In emergent archival research, liberation may well lie in the challenge of applying the apparent opposites of interpretive and positivist approaches to studying archival phenomena. In part this may lead us to redefine, even refigure, the phenomena of interest to us. In part it may lead to understandings that some phenomena in our world behave in ways which are susceptible to being seen from a positivist perspective, while others are more readily understood from an interpretivist viewpoint. And perhaps the creative tension generated will lead us to yet other ways of seeing.

*Archival research and the double hermeneutic: archival science as a meta discipline*

Marcia Bates has argued that Information Science, like education and journalism, is a “meta-field”, characterized by the way in which it cuts

<sup>35</sup> For extended discussion of positivist, post-positivist, and interpretivist research paradigms, see Williamson, op. cit., especially Chapter 2, “The Two Traditions of Research” (Kirsty Williamson with Frada Burstein and Sue McKemmish); quotes from pp. 27–30.

<sup>36</sup> Harris, V., “Law, Evidence and Electronic Records: A Strategic Perspective from the Global Periphery” (ICA Seville, September 2000), available via <http://www.archivists.org.au>

across so-called “content disciplines”. In meta-fields, “the content of all the conventional disciplines is being shaped and molded for a societal objective through different types of professional activities involving the manipulation and transmission of knowledge”. Bates posits that research in meta-fields analyses the *processes and domains* associated with the professional activities being carried out in each case “though each field covers all kinds of knowledge or information, each nonetheless has particular domains it studies, which cut across all the conventional subject disciplines. These domains are distinguished not by their subject content, which can be highly various, but rather by their rhetorical character in the broadest sense, that is, by their selection, design, and objectives”.<sup>37</sup>

Schauder has characterized this “mind bending” aspect of the double hermeneutic involved in research in the information meta-disciplines thus:

It is yet another manifestation of the toughness of information management and systems research that *what* is studied – information phenomena – are in essence the same as *how* they are studied – the ‘tools’ used to study them. Both are constituted of processes of modelling.

Thus information researchers, in studying how people create a model or representation of knowledge, in turn create information models or knowledge representations that explain the models they are studying:

... what information management and systems researchers are modelling is other people’s information modelling!<sup>38</sup>

## Designing Research

Research methods, techniques and tools, which provide researchers with ways of observing and modelling the phenomena they are studying, are creatively combined in research design. Although Williamson offers a useful distinction between method and technique, characterizing the former as a research approach “underpinned by theoretical explanation”, and the latter as simply a “means by which data are gathered and samples selected”, whether an approach is identified

<sup>37</sup> Bates, Marcia J. “The Invisible Substrate of Information Science”, *Journal of the American Society for Information Science* 50(12)(1999): 1043-1050.

<sup>38</sup> Williamson, op. cit., p. 307 and 308, respectively.

as a method or as a technique is not always so clear-cut, and will depend upon how they are applied within a specific research design.<sup>39</sup>

Designing research frameworks, particularly in the large multidisciplinary collaborative projects that are currently a feature of archival research culture, usually involves rigorous definition of research questions, mixing and matching research methods, triangulation of complementary methods to tease out multi-dimensional problems or questions, and meta-analysis of data collected through different methods. Research questions drive both the design and the selection of the methods to be used.

Issues of reliability and validity in research design, whether it be quantitative or qualitative, along with issues of generalizability in positivist frameworks, and transferability in interpretivist ones are closely associated with the degree of rigour in the research. Reliability refers to the extent to which a measure, repeatedly taken, will yield the same result, and is one necessary component of validity. Validity refers to the degree to which the research design is accurately measuring what it is designed to measure. Generalizability refers to the extent to which the findings and conclusions of one particular study can be applied to other similar situations or settings, or the population at large, whereas transferability relates to the extent to which the findings of one study can inform understandings of similar phenomena in different contexts. Triangulation, or the use of multiple methods, can be used to investigate different aspects of the same phenomenon and thus tease out complexities and reduce bias in the research. An example would be using automatic transaction logging together with a survey and participant observation to capture how a user interacts with an online archival information system.

Ideally research designs are linked to a larger strategic picture, as is illustrated in Figure 1. This model, on the horizontal, identifies the stages involved in formulating the research design. It includes three feedback loops – two addressing situations where a research design needs to be modified. This may occur when unforeseen issues arise, for example, with recruiting subjects or the nature of the data gathered; or because of a desire to add to the research study, perhaps because of an unanticipated finding or because of a new idea or research need that emerges in the course of the research. The third feedback loop represents how the findings of, or synergies between, researchers and partners working on a project generate new ideas and questions that lead to the development of further research projects. The vertical inputs on

<sup>39</sup> Williamson, *op. cit.*, pp. 191 and 205, respectively.



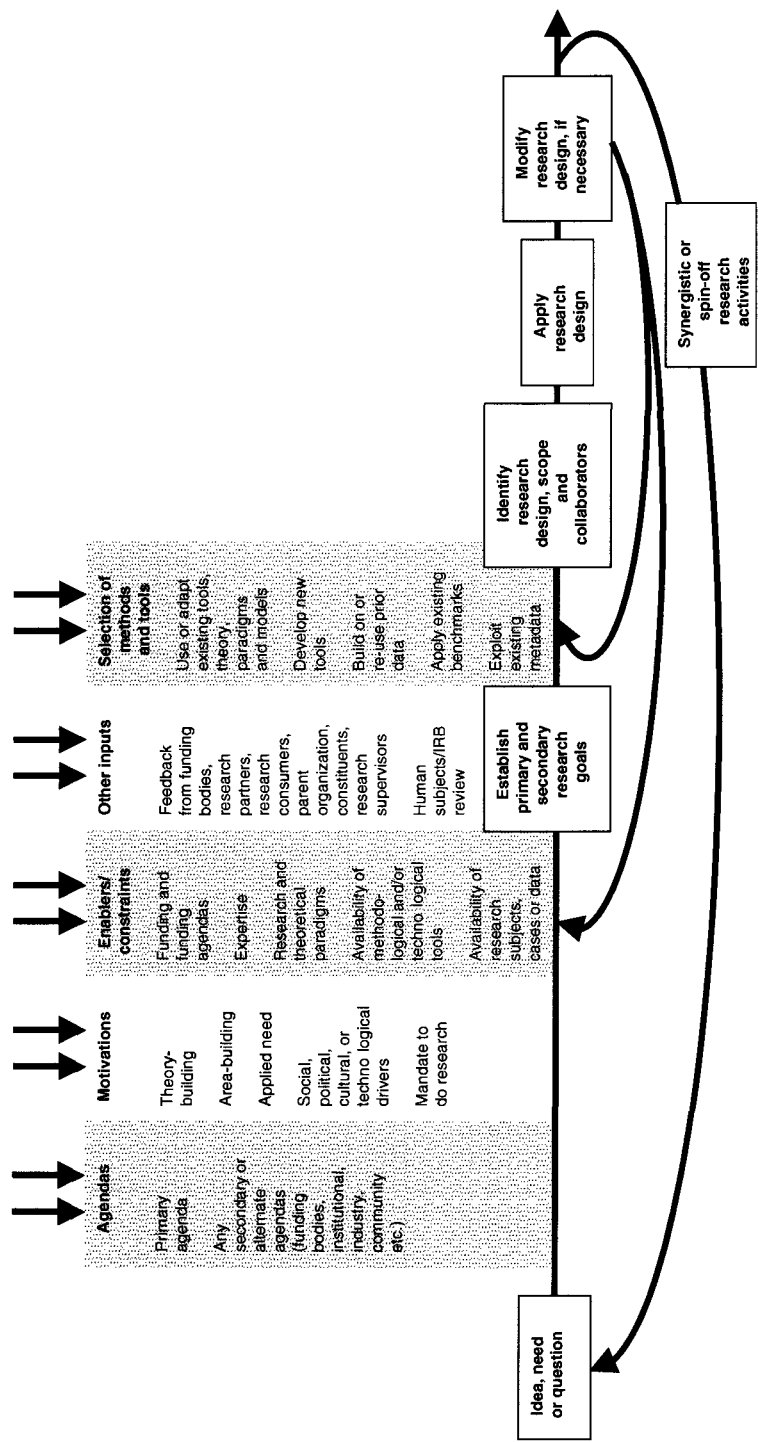


Figure 1. A model for individual or collaborative transdisciplinary research.

the model represent considerations that influence the establishment of research goals and how those goals are pursued.

In emergent areas of research relating to local and indigenous communities, as referenced in Table III, a number of challenges relating to the governance, design and protocols associated with research may arise. In relation to such emergent agendas, McKemmish, Gilliland and Ketelaar have argued:

Research methods and protocols would also need to be developed and applied in ways that respect the culture and knowledge systems of the communities engaged with the research. Ideally research teams would include researchers recruited from the local communities, while community elders and stakeholders would be included in advisory groups which would have input to all aspects of the research including the research design, as well as data collection, analysis and dissemination. Such consultation and collaboration with the communities engaged in the research would hopefully result in models for engaging in meaningful dialogue with communities, and for building the mutual respect that is crucial to addressing their archival needs.<sup>40</sup>

### **The Evolving Archival Research Toolkit: New and Enhanced Research Methods and Techniques**

We are witnessing a diversification in the research methods that are being used in archival research. Whereas 15 years ago, archival research predominantly used historical, survey and case study methods, more recently we can identify the use of action research, literary warrant analysis, ethnography, content and discourse analysis, systems design and development, theory-building, and model building, to name some of the methods that have been adopted, adapted, and applied to investigate archival research questions. We can also see how these new methods are evolving. One example would be the early use of literary warrant by Wendy Duff as part of the Pittsburgh Project, compared with the method as subsequently applied by Kate Cumming in her PhD thesis on the development of the Australian Recordkeeping Metadata Schema, and its more mature usage by Livia Iacovino and InterPARES 2.<sup>41</sup>

<sup>40</sup> Sue McKemmish, Anne Gilliland, and Eric Ketelaar, op. cit., p. 168.

<sup>41</sup> See Duff, W., *The Influence of Warrant on the Acceptance and Credibility of the Functional Requirements for Recordkeeping*, Ph.D. Dissertation (University of Pittsburgh); Cumming, K., *Purposeful Data: The Roles and Purposes of Recordkeeping Metadata*, PhD Thesis (Monash University, 2005); Livia Iacovino's paper in this issue of *Archival Science*; Gilliland, Rouche, Evans and Lindberg, op. cit.

Another example is ethnography which has been adapted to apply to archival practice (for example in the work of Karen Gracy), and the archive or record (for example, the work of Kalpana Shankar, Beth Yakel and Ciaran Trace).<sup>42</sup> Comparative archivistics uses case studies and ethnographical methods to explore similarities and differences in record-keeping cultures and practices.<sup>43</sup>

We can also identify the development and evolution of methods that are distinctive to archives and recordkeeping, for example functional, business process and recordkeeping system analysis.

Diplomatics provides a particularly interesting example of a method developed several centuries ago to ascertain the authenticity of medieval documents that has been reinterpreted and extended as documentary forms have evolved. Today, contemporary archival diplomatics is being applied to address concerns about the reliability and authenticity of electronic records.<sup>44</sup>

Appendix Table A.I introduces a range of methods, techniques and tools currently being applied in archival research, gives an indication of their epistemological lineage and application scope in parent fields in both positivist and interpretivist paradigms, and identifies how they have been used in recent archival research.

## Charting the Field

The maturation of the field of archival science, and the recent blooming of research opens up yet another area for investigation that has, as yet, been only briefly addressed – charting the development of the field itself. Reflexivity is perhaps a hallmark of maturation, and as other so-called “information” fields now begin to reflect on their 19th and early 20th century origins and trace the major ideas that have shaped the identify of the fields, there has been a rise in research discerning the evolution of intellectual landscapes. Bibliometrics is a statistical method that allows

<sup>42</sup> See Gracy, K., *The Imperative to Preserve: Competing Definitions of Value in the World of Film Preservation*, Ph.D. Dissertation (Los Angeles: University of California, 2001) and her paper in this issue; Shankar, K. *Scientists, Records, and the Practical Politics of Infrastructure*, Ph.D. Dissertation (Los Angeles: University of California, 2002), and her paper in this issue; Trace, C., *Documenting School Life: Formal and Informal Imprints of a Fifth-grade Classroom*, Ph.D. Dissertation (Los Angeles: University of California, 2004); and Yakel, E., *Recordkeeping in Radiology: The Relationships between Activities and Records in Radiological Processes*, Ph.D. Dissertation (University of Michigan, 1997).

<sup>43</sup> Ketelaar, E. “The Difference Best Postponed? Cultures and Comparative Archival Science”, *Archivaria* 44 (1997): 142–148.

<sup>44</sup> For a fuller discussion of the application of contemporary archival diplomatics, see Heather MacNeil’s article in this issue “The Use of Contemporary Archival Diplomatics as a Method of Inquiry: Lessons Learned from Two Research Projects.”

researchers to look at the intellectual landscape of a field in order to discern relationships, trends and influences between publications, authors, and subjects (what has also been referred to as “visualization of literatures”<sup>45</sup>). Anne Gilliland-Swetland and Richard Cox have both employed bibliometrics to examine facets of the field as revealed through its literature. They looked at electronic records and automation issues, and Gilliland-Swetland also examined the appraisal literature in order to identify influential figures and themes.<sup>46</sup> Other methods, however, are available for this kind of work. Sociometrics, a method which is closely related to bibliometrics, applies statistical techniques to interaction patterns between individuals in order to ascertain communication “hubs,” invisible colleges, and other individuals or groups who wield influence. Both bibliometrics and sociometrics could be used in archival science to identify patterns of collaboration between key researchers and the associated transmission and development of ideas, or trace the influence of particular academic programs and their faculty and graduates. Ethnography (such as that undertaken by Karen Gracy) and “meta-ethnography,” which attempts to integrate the findings of diverse research projects that are related by topic, can also be used to describe the field, its practices and its evolution.<sup>47</sup> Holistic perspectivism, which examines different epistemological positions (for example, standpoint epistemology and positivism), can be applied as a technique for assessing competing knowledge claims.<sup>48</sup>

### **Sustaining and Extending the Research Front**

This paper has discussed the characteristics of emergent archival research culture, related research paradigms and the evolving toolkit of research

<sup>45</sup> See, for example, Hood, W.W. and Wilson, C.S., “The Literature of Bibliometrics, Scientometrics, and Informetrics”, *Scientometrics* 52(2): 291–314, and Borner, K. et al., “Visualizing Knowledge Domains”, *Annual Review of Information Science and Technology* 37 (Medford, NJ: Information Today), pp. 179–255.

<sup>46</sup> See Gilliland-Swetland, A., *Development of an Expert Assistant for Archival Appraisal of Electronic Communications: An Exploratory Study*, Ph.D. Dissertation (University of Michigan, 1995); Cox, R., “Searching for Authority: Archivists and Electronic Records in the New World At the Fin-de-Siecle”, *First Monday* (2000); and Gilliland, “Archivy and the Computer: A Citation Analysis of North American Archival Periodical Literature”, *Archival Issues* 17(2) (1992): 95–112.

<sup>47</sup> See Bales, S. and Wang, P., “Consolidating User Relevance Criteria: A Meta-ethnography of Empirical Studies”, poster paper presented at *ASIST 2005 Annual Meeting*; and Wang, P., “Finding Information in Digital Libraries: A Framework for Integrating Studies of User Behaviours”, poster paper presented at *The 7th International Conference on Asian Digital Libraries* (Shanghai, China, December 13–17, 2004), both available from <http://web.utk.edu/~peilingw/>.

<sup>48</sup> See, for example, Dick, A.L., “Epistemological Positions and Library and Information Science”, *Library Quarterly* 69(3) (1999): 305–323.

methods, techniques and tools available to those engaged in designing archival research. There is no doubt that the past 15 years have been a period of tremendous advances, not only in archival knowledge, but in building the elements of an archival research infrastructure. What, then, will it take to sustain and extend this emerging research front?

Firstly, there must be shared understandings of the role and importance of research that support the continuing development of archival research culture. Secondly, there must be a corpus of researchers who have a sound conceptual archival knowledge and who are educated in the conduct of rigorous research. Thirdly, agenda-setting must occur at the individual, institutional, local and national, if not international level. This agenda-setting should identify strategic and relevant research activities to meet the short and long-term needs of the discipline, profession, relevant institutions and industries, communities and society. How to reach consensus in the archival field on research priorities and how to articulate these persuasively to potential funding bodies both need to be subject to further discussion and development. Fourthly, having achieved some consensus on these agendas, it is important to use them to influence the priorities of funding agencies. Fifthly, much of the richest intellectual ferment has occurred in recent years as a result of fertile research collaborations, both within and outside our own field. We need to find ways to nurture and extend research partnerships, engaging with the profession, institutions and communities in ways that are likely to result in ongoing intellectual excitement and research output. Sixth, we should continue to engage in transdisciplinary research based in our own and related fields. Seventh, we should work to build depth of research and consolidation of results in particular research areas in order to develop a more thorough understanding of those areas and how they change over time. Eighth, we need to analyse and reflect upon our own research output in order to chart the development of our own field, its paradigms and assumptions, and identify areas where there are gaps that should be investigated. Finally, it is critical that we disseminate the results of our research, not only in the venues that are most comfortable for us (such as our own professional conferences and journals), but also in those of the communities who need to learn about our research concerns and results. What is more, the more we are able to publish in highly competitive peer-reviewed journals outside our own field, the more our claim to academic status will be recognized and enhanced across disciplines and within the academy.

## Appendix

Table A.I. Research Methods, Techniques and Tools<sup>a</sup>

Method name	Definition	Application in Archival Research
Theory Building	Systematic building and exposition of new theory, drawing on existing theories, concepts and models, observation, scholarly communication, data derived from other methods, and characterized by reflection, deep thought and a process of gestation of ideas (see Lynham 2002; Williamson, 2002, Chapter 1).	Reflection upon and augmentation of archival theory, and development of new theories and theoretical models. <i>Examples:</i> Appraisal theory (Cook, 1992); development of Records Continuum theory and Records Continuum Model (Upward, 1996, 1997); theorizing about the nature of the record and archival theory itself (Nesmith, 1999, 2002); archival theory and deconstructionism (Harris, 2001); development of theories and models of archival description (Hurley in a series of articles, e.g. 1995a, b, 1998, 2000); archival hermeneutics (Brown, 1991–2).
Grounded Theory Development	“Built from the ground upwards”, this method is concerned with discovering concepts and hypotheses and developing theory directly from data that is collected from the field and provides relevant and interesting cases for analysis. Tends to be associated with interpretivist research (see Williamson, 2002, Chapter 2).	Exploratory research where little is known about a particular situation or phenomenon. <i>Example:</i> Much of the early research relating to electronic records used this approach, for example the University of Pittsburgh project relating to Functional Requirements for Electronic Recordkeeping (as reported in Bearman, 1994), the Indiana University Electronic Records Project (Bantin, 1998) and the research and development work undertaken at State Records New York (as reflected in Hedstrom, 1997).

Content Analysis	Examination of both the visible and the underlying, latent or symbolic content of a document based upon a system of coding content (see Roberts, 1997; West, 2001a, b; Neuendorf, 2002; Babbie, 2004; Krippendorf, 2004).	Analysis of professional discourse to establish trends in evolution of records continuum thinking and practice. Analysis of discourse to identify the postcustodial paradigm shift and its key features.
Discourse Analysis	Use of analytical constructs for the historical analysis of ideas, looking at the principal aspects of the discourse in terms of the context of the time and using the literature of the discipline and related disciplines, the major sources for theory building. This method assumes a constant evolution of ideas and identifies when radical changes occur and their impact on existing concepts. It often focuses on discourse generated by influential parties to examine what it reveals about ideologies and power differentials (see Fairclough, 1989; Frohmann, 1989; Iacovino, in this issue).	Analysis of records or information policy or legislation development. Tracing the emergence of certain aspects of archival administration such as electronic records management as priority issues for the profession. Identification of counter narratives or submerged narratives.
Narrative Analysis	Body of related unobtrusive techniques for examining how narrative or rhetorical tropes are used in documents to "tell stories", or advance specific perspectives or arguments (see Abbott, 2003).	Analysis of concepts to improve understandings of the ways in which particular concepts are (or could be) used for communicating ideas about archival science.
Conceptual Analysis	"A technique that treats concepts as classes of objects, events, properties, or relationships. The technique involves precisely defining the meaning of a given concept by identifying and specifying the <u>conditions</u> under which any entity or phenomenon is (or could be) classified" (Furner, in this issue; see also Jackson, 1998; Leiter, 2004).	<i>Examples:</i> Examinations of archives, power, and memory (Ketelaar, 2005); Derrida and the archives (Brothman, 1999); the nexus between recordkeeping, law and ethics (Iacovino, 2002); history of archival ideas (Cook, 1997); analysis of the concept of evidence (Furner, in this issue).

Table A.I. Continued<sup>a</sup>

Method name	Definition	Application in Archival Research
Expert Knowledge Analysis	Elicitation and codification of expert knowledge into a knowledge representation scheme or set of rules that can be automatically implemented through an expert system to undertake a task or make decisions that would normally require a human (see Giaratano and Rile, 2004).	Analysis and processing of online reference inquiries. Automatic application of archival description rules. Automated or semi-automated creation of metadata. <i>Examples:</i> Automating appraisal decisions (Gilliland-Swetland, 1995)
Literary Warrant Analysis	The literary warrant for professional practice is made up of authoritative sources, which are recognized and valued by practitioners. Such authoritative sources may be found in the law, codes of ethics, standards, the professional and scholarly literature, and literary texts. Analysis of the literary warrant for professional practice establishes the "mandates" for best practice, and identifies its conceptual and theoretical frames of reference (see Duff, 1998).	Identification of social mandates for personal record-keeping through analysis of sociology texts, and creative and reflective writings. Analysis of literary warrant to establish recordkeeping requirements. Analysis of standards, statements of best practice, and research reports to identify recordkeeping metadata requirements.



Archival or Recordkeeping Warrant Analysis	Archival or recordkeeping literary warrant analysis was derived from, but is significantly different from the use of literary warrant analysis <sup>b</sup> in developing "the structure of a classification system on the basis of materials to be classified rather than on purely theoretical considerations" (Young, 1983: 135).	<i>Examples:</i> Literary warrant for evidence (Duff, 1996); exploration of recordkeeping warrant for metadata schemas in Monash Recordkeeping Metadata Project (Cumming, 2005) and in the development of the Literary Warrant Database in InterPARES2 (Gilliland et al., 2005).
Diplomatics	Body of techniques, theories, and principles for analysing the form, function, and genesis of documents, with a particular view to establishing authenticity (see Duranti, 1998).	Analysis of changes and continuity in document forms over time. Identification of record types in electronic systems.
Contemporary Archival Diplomatics	See also MacNeil in this issue.	Identification of requirements for preserving authentic records in electronic systems. <i>Examples:</i> Identification of requirements for ensuring and assessing reliability and authenticity in records (InterPARES 1 and 2 as reported in Duranti et al., 2002 and InterPARES, 2005; UBC Project as reported in Duranti and MacNeil, 1996); analysis of records of modern Italian administration (Carucci, 1987).

Table A.I. Continued<sup>a</sup>

Method name	Definition	Application in Archival Research
Ethnography Recordkeeping/ Archival Ethnography	Systematic contextual and reflexive description of individual cultures and practices. The goal is to understand the insider's (emic) view of his or her own world.	In-depth studies of recordkeeping and archiving practice in different national and cultural contexts Studies of recordkeeping/archival communities of practice
Ethnography of the Archive	Positivist ethnographers seek "the truths behind human activity and behaviour". They see themselves as detached observers, discovering the timeless and essential aspects of the culture they are studying. Interpretivist ethnographers on the other hand aim to understand situations and events with reference to the actors own constructions of meaning and interpretations of reality, and acknowledge their own subjectivity and partiality. Whereas positivists seek to abstract and decontextualize the objects of their study, studying the contexts of the phenomena they are exploring is an integral part of interpretivist ethnographic research (Saulle, 2002: 161).	Studies of role of national archival authorities in democratic societies. In-depth studies of archival practices such as reference services. Community-based fieldwork studies of archival and related issues in the socio-cultural realm of record creation, management, preservation and use. Examination of records creation and record-keeping practices in specific institutional settings.

Ethnology Recordkeeping/ Archival ethnology	Cross-cultural, comparative study of the everyday practices and beliefs of contemporary or past cultures. In particular, the study of the ways in which people use social interaction to make sense of or understand their situation and create their own reality.	Studies of cultures of documentation, the forms of records and archives, the recordkeeping and archiving processes that shape them, the worldviews made manifest in their systems of classification, the power configurations they reflect, and associated memory and evidence paradigms.
Case Studies	See also Gracy and Shankar (in this issue), Geertz (1973), Sanday (1983), Hammersly and Atkinson (1995), Stringer et al. (1997) and deMarrais (1998).	<i>Examples:</i> Recordkeeping and radiology (Yakel, 1997, 2001); preservation practices (Gracy, 2001); records as infrastructure in science laboratories (Shankar, 2002); colonial cultures of documentation (Stoler, 2002); children's socialization into recordkeeping (Trace, 2004).
Comparative Case Studies	In-depth study of an individual situation, institution, or process, including comparative studies.  Positivists may use case studies to test hypotheses or the generalizability of their research findings, while interpretivists aim to understand particular cases in complex detail,	In-depth study of individual accountability crises, with a particular focus on recordkeeping issues  Detailed investigation, description and analysis of records continuum best practice and standards

Table A.1. Continued<sup>a</sup>

Method name	Definition	Application in Archival Research
Action Research	to compare against other cases, and sometimes to transfer understandings gained in one particular instance to another (see Ketelaar 1997 recomparative archival science; Darke and Shanks, 2002: 93-94; Babbie, 2004). See also Oliver (in this issue).	Detailed description and analysis of specific services or electronic records or digital access initiatives at one or more institution. <i>Examples:</i> recordkeeping and national culture (Oliver, 2005); archival custody and memory, a case study of the US Virgin Islands (Bastian, 1999, 2003); PROFS case study (Wallace, 1997); case studies relating to recordkeeping and accountability (Cox and Wallace, 2002).
	Critical reflection based on experience of participating in action, usually aimed at bringing about a change in practice. This method is used implicitly in many evaluations of practice (Oosthuizen, 2002: 141-143). "Differs from case research in that it involves the researcher entering the field as an active participant rather than as an independent observer. The researcher collaborates with participants at the site to help understand and solve their practical problems and concerns, and at the same time the problem solving process is also the subject of research" (Oosthuizen: 112).	Collaborative research and development projects involving university, industry and professional partnerships and using archival institutions or recordkeeping programs as the locus of the research. <i>Examples:</i> Research and development relating to functional appraisal in the Pivot project, National Archives of the Netherlands (Hol and de Vries, 1998); macroappraisal at the National Archives of Canada (Cook, 2001); Victorian Electronic Records Strategy (Heazlewood, 1999).

“Action research could be seen as a hermeneutical approach concerned with the study of human actions and social practice ... Action research is often intended to bring about change of practice, while creating knowledge at the same time” (Oosthuizen: 159–160).

See also McKernan (1991) and McCutcheon and Jurg (1992).

Historiography	Body of techniques, theories, and principles of historical research and presentation involving a critical examination, evaluation, and selection of material from primary and secondary sources (see Johanson, 2002).	Historical study of evolution of records continuum thinking and practice. Analysis of the historical development of archival institutions, movements or legislation. Evaluating the extent to which digital access initiatives facilitate the research practices of historical scholars. <i>Examples:</i> History of recordkeeping, archival profession and archival practice (Piggott, 1998; Cox, 2000; Ketelaar, 2003).
Bibliometrics	Statistical, often computerized, methods for analysing historical data. Sometimes included under the rubric of “informatics.”	Analysing historical recordkeeping practices, e.g., occurrence of certain data elements in records, or consistency of linkages between different data elements.
Sociometrics and social network analysis	Statistical methods for analysing complex relationships between and attitudes of members of a social grouping.	Description and analysis of interaction between collaborators participating in multi-institutional initiatives.

Table A.I. Continued<sup>a</sup>

Method name	Definition	Application in Archival Research
Cliometrics	Statistical, often computerized, methods for analysing historical data, the use of econometrics techniques to study economic history. See Borgman and Furner (2002) and Egghe and Rousseau (1990).	Identification of “invisible college” phenomena among archival practitioners or researchers. Citation analysis of archival literature examining the extent to which authors draw upon literature from other disciplines. Analysis of the aging and scattering of archival literature. <i>Examples:</i> Citation analyses (Gilliland-Swetland, 1992; Cox, 2000); metrics applied to user studies (Yakel, 2004)
Surveys, interviews, focus groups	Written or oral surveys designed to produce systematic, representative, qualitative and quantifiable data based on responses provided by individuals within a targeted population to a predetermined set of questions. These can be made more reliable through the use of structured, in-depth interviews. Positivists are more likely to employ quantitative survey instruments, while interpretivists tend to prefer qualitative techniques of data collection and analysis (Tanner, 2002: 71).	User needs and attitudes analysis. Tracking of graduates of archival education programs. Surveying of current archival practices. <i>Examples:</i> Archival personality types utilizing a written survey (Craig, 2000; Pederson, 2002); user information seeking practices using survey techniques (Gilliland-Swetland, 2001); exploring the archival needs of Australian Indigenous communities using focus groups and interviews in the Trust and Technology: Building

“Survey research involves the collection of primary data from all or part of a population, in order to determine the incidence, distribution, and interrelationships of certain variables within the population. It encompasses a variety of data collection techniques, for example, questionnaires (print or electronic), interviews (face to face or telephone), and observation techniques” (Tanner, 2002: 89).

A focus group is an interview on a particular topic, conducted by a skilled moderator with a small group of individuals, usually 7–10. Focus groups are extensively used as a data collection technique in interpretivist research within research designs utilizing ethnography or grounded theory methods (see also Williamson, 2002, Chapter 14).

Systems analysis	Analysis and evaluation of activities, processes, and functions in complex systems (industrial, human, technological).	Developing innovative policy and strategies, new standards and procedures.
Functional and Business Analysis		
Recordkeeping System Analysis	Methods and techniques for functional and business analysis, work process analysis, recordkeeping and archival system analysis were adapted from more generic methods and analytical techniques.	Building or adapting systems to meet the challenges of electronic recordkeeping and archiving.

Table A.I. Continued<sup>a</sup>

Method name	Definition	Application in Archival Research
Archival System Analysis	Initially they were developed for use in recordkeeping and archival practice, e.g. in system specification, appraisal and disposal, the development of business and archival classification schemes, the development of access policy (see SRA NSW, DIRKS, 2003).	Identifying how records are created and used within recordkeeping systems.
Work Process Analysis	They have been increasingly applied also in research and development projects involving grounded theory, case study and action research approaches. They are often used in conjunction with systems design and development, and modelling methods and techniques.	Understanding the societal and organizational mandates that govern recordkeeping. <i>Examples:</i> Standardization of archival description in UK, Canada, USA and Australia (for example Hurley's Common Practice Rules); authenticity requirements for student record systems (Park); data gathering and analysis in recordkeeping case studies in InterPARES1 and 2; much of the early research on electronic recordkeeping (Bantin and Bernbom, 1996), and research and development projects on functional appraisal and macroappraisal (Cook, 2004) used these techniques (see also entries for Grounded Theory and Action Research).
Systems Design and Development Prototyping	"Systems development as a research method may bridge the gap between the technological and the social sides of information systems research" (Burststein, 2002: 148).	Electronic records preservation technology development. Developing a prototype system (a working version or model) as a proof of concept or demonstrator of the underlying theory



Iterative Systems Design	<p>“Systems development has also been referred to as ... a developmental and engineering type of research, which falls under the category of applied science. It is grounded on the philosophical belief that development is always associated with exploration, advanced application and operationalization of theory ...” (Burststein, 2002: 148; see also Nuna-maker et al., 1990–1991).</p>	<p>Using a prototype as a research artefact which can form the basis of ongoing and expanded research. Expressing new concepts or technologies in ‘a tangible product’.</p>
Tools Development	<p>These techniques are often applied within research designs using grounded theory, case study or action research approaches. They are often employed in conjunction with systems analysis and modelling methods and techniques. See also Evans and Rouche (in this issue).</p>	<p><i>Examples:</i> These techniques have been extensively used in the Clever Recordkeeping Metadata project to develop a demonstrator of a metadata broker in a web service environment (Evans et al., 2005); and in the development of MADRAS, the Recordkeeping Metadata Schema Registry in InterPARES2 (Gilliland et al., 2005).</p>

Table A.I. Continued<sup>a</sup>

Method name	Definition	Application in Archival Research
<b>Model Building</b>	Use of formal activity, entity, relationship, role and data modelling techniques (IDEF, UML, ORM, DFD, RDF) in iterative, exploratory processes, enabling precise description and structuring of functions, processes, information flows etc.	Developing conceptual and descriptive models of recordkeeping and archival activities and functions such as records creation, appraisal, description, preservation and access to explore electronic recordkeeping functionalities and system design requirements.
<b>Descriptive Models</b>	Use of formal activity, entity, relationship, role and data modelling techniques (IDEF, UML, ORM, DFD, RDF) in iterative, exploratory processes, enabling precise description and structuring of functions, processes, information flows etc.	Building conceptual models for describing records in their societal, business, and documentary contexts
<b>Conceptual Models</b>		
<b>Metadata Modelling, Mapping and Crosswalks</b>	Modelling and mapping metadata sets enabling precise description and structuring of metadata sets, and providing a graphical means to communicate sets. Meta mapping establishes equivalences and correspondences between metadata sets, as well as identifying gaps and inconsistencies. It uses concept mapping techniques to identify major concepts and illustrate their inter-relationships.	Use of formal modelling, e.g. RDF and ORM, and mapping techniques in developing, structuring, testing and validating recordkeeping metadata sets and standards.
<b>Empirical instantiation</b>	Systematic use of examples to populate models in order to test their validity, and highlight areas for further investigation and development.	Formal modelling of meta maps to enable automatic translation between recordkeeping metadata sets, including those implemented in legacy systems.

These techniques may be applied within research designs using grounded theory, case study or action research approaches. They are often employed in conjunction with systems analysis, design and development methods and techniques.

*Examples:* These techniques have been extensively used in the Australian Recordkeeping Metadata Schema project (McKemmish et al., 1999); the development of the Preservation Model in InterPARES1 (InterPARES, 2005); and in the Clever Recordkeeping Metadata and InterPARES MADRAS projects (see also entry for System Design and Development).

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<sup>a</sup>This table identifies and provides definitions of research methods and techniques used in archival research, suggests ways in which they may be applied, and gives selected examples of their application. It is supported by a list of references relating to the methods and techniques, and to examples of their application taken from recent archival literature in English.

<sup>b</sup>The term "literary warrant" was first used in 1911 in an article by Wyndham Hulme. Hulme used the term specifically to refer to the fact that the vocabulary of the Library of Congress Classification was empirically based on the warrant supplied by the Library's collection rather than on the warrant supplied by other means such as classification theory and attempts to classify the whole body of knowledge, or by readers' requests.

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