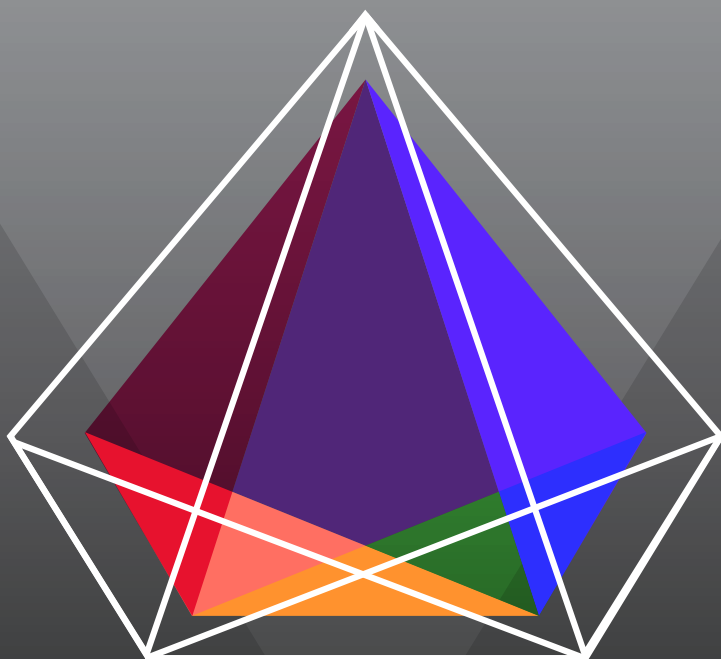


Recordkeeping Informatics for a Networked Age

Frank Upward, Barbara Reed, Gillian Oliver and Joanne Evans



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So that, at each moment, everything tends to be spread out into an instantaneous, indefinitely divisible continuum, which will not prolong itself into the next instant, but will pass away, only to be reborn in the following instant in a flicker or shiver that constantly begins again

Gilles Deleuze, *Bergsonism*,
translated by H. Tomlinson and B. Habberjam
(New York: Zone Books, 1988), 86–87.

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PREFACE

*At the still point of the turning world. Neither flesh nor fleshless;
Neither from nor towards; at the still point, there the dance is,
But neither arrest nor movement. And do not call it fixity,
Where past and future are gathered. Neither movement from nor
towards,
Neither ascent nor decline. Except for the point, the still point,
There would be no dance, and there is only the dance*

T.S.Eliot, 'Burnt Norton', II.

One reviewer of the manuscript of this book commented that it would benefit from having a Chapter 0 to present its background and help readers understand its structure. In one sense this can be handled quickly. Our background is that we are records continuum practitioners with connections to the Records Continuum Research Group established at Monash University in Melbourne. That background has influenced the book's structure, which has been devised by taking meta-prescriptions for nanosecond archiving back to their root meanings within the 'arch' of governance. The ordering of governance these days has to cope with motion, unfolding reality, matrices for archival formation, kinetics, dynamics, and any other way of expressing the need for recordkeeping informatics as a discipline to be always forming and expanding. The ordering of this book tries to capture that need for movement of the pieces and the search for the still point within that movement.

A widely known example of 'arch' theorising is Anthony Giddens' structuration theory in which structures and action as joined pillars operate across historically developed situations.¹ Giddens' models provide still points for what T.S. Eliot called the dance. In this book that interaction is crystallised in our use of the neologism, simplicity. As continuum archivists, we appreciate simple monistic explanations, such as the argument that all things are interconnected, but we are also attuned to the need to

1 Anthony Giddens, *The Constitution of Society* (Cambridge, Polity Press in association with Blackwells, 1986).

base our simplifications upon as full a recognition and understanding of the expanding complexity of the many interconnected parts as possible. Simple solutions, if they are to be of real use, should never be plucked out of nowhere. The book is not opposed to basic simplicities, however. Within the flux there is a chance of stability, of finding points around which things can form. In the following summary of the book's structure we try to blend a description of the book's chapters with an indication of their interconnections with the whole and the other parts.

In Chapter 1 we identify one potential source of logical stability – the recordkeeping single mind. The focus of that mind is upon the way recordkeeping governs both the good and bad health of any society, organisation, group or individual. It is at the heart of what Giddens calls authoritative information resource management. Such management provides for more adequate management of events and actions over spacetime, facilitates mutual associations between people, and supports individual, group, organisational and communal life-chances. In essence this form of sociology is continuum-style thinking in which governance can be conceptualised as recorded information relating to the ongoing management of the web of relationships within which people live and operate. The recordkeeping specialisation has a number of distinctive tasks related to that web, such as finding new approaches to the age-old issue of bundling communications during business processes. In the paper era connecting communications up within files was at the heart of governance but the recordkeeping single mind now has to operate with many other minds within recordkeeping informatics design and implementation projects, including those whose primary focus is information management (IM), information systems design (ISD), or data warehousing (Big Data).

Chapter 2 provides a short history of recordkeeping informatics, beginning early in the twentieth century when recordkeeping was the dominant way of combining information management and information systems tasks with governance. It then traces the subsequent fragmentation of informatics within a short history of archival thinking over the last hundred years. The fracturing of the information professions sets up the need for the form of convergence and divergence explored in this book. Details for inclusion in the story of how informatics got to the point it now occupies in relation to the archival still point have been selected for their relevance to understanding the obstacles in the evolution of the once-strong recordkeeping single mind as the century shifted from a scientific evidence-based age into an information age and began to form the base for today's networked age. The

focus is upon records continuum practices and Australian adaptations of 1930s Anglo-American archival theory which involved blending the British emphasis on the moral defence of the record (Jenkinson) and a search for the unities in records and archives management in the United States. The American and British approaches were formally directed at national government archives, but the Australian continuum twist meant that something new emerged that never lost sight of the governance role of records in personal and business recordkeeping.

The essence of our recordkeeping informatics matrix is set out in Parts Two and Three of this book. We use the word matrix with extreme care because it suggests a still point in a turning world. It implies a structure that brings together frameworks and actions in evolutionary fashion directed at coping with the diversity of processes and contingencies impinging on archival formation. In other words, these parts provide a framework in which twenty-first century archives can originate, develop, take shape and be contained. The matrix provides a flexible and interconnected professional playground for educating and training recordkeeping informaticians within a new and expanding disciplinary base, or, in poetic terms, it sets up a modern archival dance, and for recordkeeping informatics there is only the dance.

Part Two presents a three-pronged analytical base for the matrix, focusing on information culture, business processes and access. We believe that what we present about information culture and business processes is in good shape for use in nanosecond archiving and can help computation techniques rise beyond chaos. Access is, however, in such a mess that we have added a chapter on recordkeeping functionality to suggest ways of sorting through the chaos. If organisations are to get productive workplace results from recordkeeping informatics, they will have to tie recordkeeping into their information culture, their business processes and their access requirements, and the ongoing results of their analyses will have to be built into the ongoing management of their business architectures.

The main methodological insight in Chapter 3 comes from research into information cultures by Oliver and Foscarini.² We accept and endorse their thesis that organisational culture is such a disparate phenomenon that it is hard to analyse in ways that can produce practical results. For a start, an analysis is too easily distorted by the analyser's ideology. Information culture

2 Gillian Oliver and Fiorella Foscarini, *Records Management and Information Culture* (London: Facet Publishing, 2014).

provides multiple layers of analysis of the sort that can produce useful, usable and less subjective outcomes. Those layers include the interactive connections between structure and action within the relationships between societal, organisational, group and individual information cultures and recordkeeping. At the organisational level, within an informatics approach, the analysis of an information culture identifies fundamental values within that culture and will influence the assessment of skills and knowledge needed in the workplace. Over time, the information culture can influence internal attitudes to governance and trust in relation to organisational business applications. Beyond the organisation, those putting in place rules and resources for the interconnected operations of our organisations also need to study information cultures. In that situated context the analysis becomes a building block for the operation of civil society.

In Chapter 4 the inbuilt informatics matrix (technology, social settings and ways of knowing) is used to show how, in evolutionary terms, the application of modernity's expanding technologies is primitive. It calls for much greater maturity in business process analysis built around the view of organisations as bundles of activities and the relevance of that view to nanosecond archiving. The chapter is based on the experiences of Reed and Upward in the workplace and in university research projects. It mixes structuration theory, Actor–Network Theory and direct experiences with recordkeeping techniques for the bundling of activities across the expanding cascades of recorded information. Organisations will have to analyse and build their way into this century business application by business application, so, in some respects, this chapter is the structure–action core of this book.

Because of its chaos the third facet of analysis, access, has been split into two chapters. The first (Chapter 5) details the problems with the dissemination of digital records; Chapter 6 uses Australian experiences to speculate about how improved recordkeeping functionality can contribute to more orderly approaches to access. Collectively, they demonstrate the time-frame problems we faced in writing this book. Chapter 5 was drafted early in the process and the examples are out of date; but new ones will also date quickly, so we have kept our original illustrations of a continuing problem and suggest readers find examples in their own time and place. Although the once slow-moving linear-based processes to produce archives are not relevant to dynamic forms of nanosecond archiving, the long-standing ethic of the archivist, the moral defence of the record as a prelude for meaningful access to it, is needed more than ever before. Who knows what ethical

positions are controlling what is happening behind and beyond our screens or the Internet of Things?

Proactive methods are needed for the design of recordkeeping informatics systems, the fruits of which will need to be authorised and implemented in robust fashion. Chapter 6, which can be used to begin to consider access-directed proactivity, has also been in place for some time. The literature of good ideas and practices for recommencing archival storage, provenance, and appraisal techniques has been expanding, but the argument we put forward is again illustrative, so we have not felt it necessary to revise it. The chapter looks at the recordkeeping functionality needed to support the speedier evolution of control techniques. It takes a fresh look at three major interconnected archival activities, all of which can underpin a new approach to access. Getting many non-archivists to understand this has been an uphill battle so far. In many informatics specialisations, access is a synonym for information retrieval and archivists have often played follow the leader in the hope that someone will lead them through the maze of technological change. Throughout this book the reader will find caustic comments on such a limited view of access and the role of archives formation. Far from supporting ethical evidence-based decision-making, information retrieval techniques can add layers of confusion, can pander to what many information professionals would regard as unethical behaviour, and can be part of what are now defined as post-truth techniques. Information retrieval on its own will be of little help in sorting out the sludge from the good oil, except within systems designed from the outset with forensic evidence in mind. That is a proactive recordkeeping informatics issue and as part of this issue we point to an array of business-based tools, including recordkeeping audit techniques, and ways of authorising tailorable and modular internet-based business applications that organisations can use within their business architectures.

In Part Three we argue that there are two building blocks for the future of recordkeeping informatics. One is continuum thinking, a regular subject of archival literature for sixty years, and the other, recordkeeping metadata, which has been subjected to extensive research in North America and Australia since the early 1990s. Depending on your position in the design endeavour, your perspective on what is a facet of analysis and what is a building block will change. For example, if you work for an archival institution that is trying to develop meta-rules and resources for archival formation across many agencies our three major facets are building blocks, whereas continuum thinking and recordkeeping metadata should be the

dominant analytical focal points. The matrix remains stable, but the way it shapes archival formation can dance.

Chapter 7 presents some of the extensive research-based continuum modelling that has taken place following the publication in 1996 of what has become known in the archives and records management professions as Upward's Records Continuum Model. It has become widely used as a still-point structuration model for the archival dance. It presents a four-dimensional view of the continuum of recorded information: creation, capture, organisation and pluralisation. These dimensions offer a parallel to the stillness of the four dimensions of Einstein-Minkowski spacetime that were incorporated into spacetime continuum metaphysics a century ago. The dimensionality of the spacetime continuum has expanded over the last hundred years, laying the base for modern multiverse theory. For some archivists, the records continuum model provides a similar starting point. It provides a basic model for recordkeeping (the home base for the specialised form of informatics outlined in this book), but the records continuum model has now been joined by models for information, publishing, cultural heritage, digital forensics, and data systems management, presented here in the one place for the first time in English language literature.

Chapter 8's research base is from the 1990s when archivists first looked to recordkeeping metadata as the key to developing new ways of implementing custody. The approach did not work then because computation design methods of the time were too clunky and too many information professionals, including archivists and records managers, regarded archives as that old paper-stuff or material that has passed its organisational use-by date. The need to engage in nanosecond archiving blows that sort of thinking out of the water. Metadata can be used within internet-based business applications to build more adequate archives using a systems design approach to recordkeeping informatics, but the fact that this is not occurring requires an explanation. In simple terms, the past has shaped too many people's view of archives. Archival documents became the fixity of the remnants of the dance, rather than the archive being the still point around which cascading inscriptions can dance. Hence Chapter 8 is directed in large part at helping readers understand why metadata approaches have become a Tower of Babel rather than an avenue for the creative evolution of nanosecond archiving. The recordkeeping single mind has so far had too little impact upon other information professions and adequate nanosecond archiving probably will be impossible until this changes substantially.

Part Four is where a new book on recordkeeping informatics, as part of the pursuit of a more professional approach to informatics, will begin if the networking challenge that ends this book is picked up. This Part can be used to begin to imagine a future where a teamwork approach to informatics can help heal the fragmentation of last century and clear some of the modern hurdles facing nanosecond archiving, especially the amateurism of innovative technical minds that currently dominates the take-up of cloud computing. We call for new forms of professionalism that can authoritatively order the allocative power of new forms of computation, changing and adjusting them to new times and spaces as necessary. In short, we add our voice to the expanding critiques of the failure of the marriage of internet and web-based technologies to meet the sort of ends behind the professional nature of their early development. Before using this preface to look afresh at how the original intentions can be revived by master informaticians, we would like to comment on the other aspect of this book that needs prefatory remarks, its background.

Background to This Book

There are many strands to the background of this book as it has four authors who have had lively discussions across its length and depth. We want to comment on two of these strands. One is the time it has taken us to produce the book and the other is its connections to academic structures for continuum teaching at Monash University. We began our collaboration on recordkeeping informatics in 2008 when we discussed the need for a new text to support the next generation of records managers. For a decade two of us had been using the 1998 revision of Kennedy and Schauder's *Records Management: A Guide to Corporate Recordkeeping* for teaching and training purposes. This revision had taken into account the Australian Records Management Standard, AS 4390, issued in 1996, which had taken a media-independent approach to recordkeeping within organisational frameworks. The challenges of recordkeeping in a digital and networked age were, however, increasingly calling for a more media-specific approach. While the topology of the standard still seemed useful as a still point in a turning world and its approach had been picked up within an international records management standard, the topography of the dance was changing dramatically. We quickly concluded that digital recordkeeping processes for this century were in such a state of flux that we needed to test our conceptual basics before venturing into textbook territory.

We first set out our preliminary sketch of recordkeeping informatics as a fuller disciplinary structure for digital archives formation in a two-part article in 2009 and 2010.³ We attempted to widen the conversation in 2012 at a conference of the International Council of Archives in a paper published the following year as an award-winning article.⁴ We mention the award to indicate that we are not alone in thinking that there is something exciting about recordkeeping informatics as a framework for nanosecond archiving. As our discussions continued we found our framework was so dynamic that there was an explosion of ideas across the writing of this book, delaying its completion as we grappled with the problems inherent in developing a method for managing the connections between recordkeeping and unfolding reality. That is something that is clearly not easy or it would have been done previously given the emphasis over the last thirty years on managing change.

It is part of the book's genealogy that its authors cannot simply focus on archives as past records, which twenty years ago was an easy way of looking away from the problems of changing forms of computation. We all have close connections with the hair shirt of records continuum practices championed within the teaching structures and programs at Monash University, whose centre of gravity has shifted from a Faculty of Arts to their current location within a Faculty of Information Technology. In one situated context, it is vaguely possible to pretend that the formed archive is the focus of archival programs; in the other, the complexities of archival formation cannot be swept under somebody else's carpet.

In a fuller genealogical sense, the history of Monash's continuum teaching structures and programs and the complexities of archival formation processes can be said to date back to 1975 when the architects of the program, Sue McKemmish and Frank Upward, began working together at the Victorian branch of the Commonwealth Archives Office. They received in-house training in records continuum strategies, tactics, and structures for the formation of archives. One of those doing the training was Livia Iacovino who also joined Monash's teaching staff and all three continuum archivists taught a special subject, *Archival Documents and Accountability* in 1991. It addressed the corporate collapses of business in Australia in the late

3 Gillian Oliver, Joanne Evans, Barbara Reed and Frank Upward, 'Achieving the Right Balance: Recordkeeping Informatics', *IQ* 25.4 (2009): 18-22 and 26.1 (2010): 42-45.

4 Frank Upward, Barbara Reed, Gillian Oliver and Joanne Evans, 'Recordkeeping Informatics: Re-figuring a Discipline in Crisis with a Single Minded Approach', *Records Management Journal* 23.1 (2013): 37-50.

1980s and the abject failure in governance they had demonstrated. It had an angry focus because basic recordkeeping principles had been neglected. As an equally angry economics journalist, Trevor Sykes, put it some years later:

Never before in Australia's history had so much money been channelled by so many people incompetent to lend it into the hands of so many people incompetent to manage it. To a man, the cowboys were asset strippers. They redistributed assets and wealth that had been created by others. The cowboys themselves created very little except chaos.⁵

Sykes, Cassandra-like, was predicting the global fiscal crisis inspired by American financial cowboys that came a year after these comments and made Australian events look like an early warning signal. In both cases money disappeared into sinkholes of corrupted recordkeeping processes, aided by emerging technologies and poor recordkeeping. The cowboys threw Australia and, later, the world into the jaws of what Canadian archivist and records manager John McDonald, described as an information wild frontier. Changes to our information and communication technologies were galloping ahead of governance and, at the leading edge of the archival profession, a number of figures, such as McDonald, were looking to develop a global vision of recordkeeping that involved a single-minded framework for combining records and archives management across electronic communications and information stores.⁶

The Australian recordkeeping single mind displayed in the book *Archival Documents and Accountability*⁷ fitted well with the new global interest in the need to tame an emerging wild frontier and found extended expression in a collection of essays, *The Records Continuum*,⁸ as well as in the formation by Sue McKemmish of the Records Continuum Research Group (RCRG), which over the last twenty years has become an instrument for global cooperation in expanding ideas and practices for the formation and management of the archival multiverse.⁹ The RCRG can be regarded as one of the parents

5 Trevor Sykes, 'Thirty-six Years of Fear and Greed', *Quadrant* 50.5 (May 2006): 9–13.

6 John McDonald, 'Archives and Cooperation in the Information Age', *Archivaria* 35 (1993): 110–118.

7 Sue McKemmish and Frank Upward, *Archival Documents: Providing Accountability through Recordkeeping* (Melbourne: Ancora Press, 1993).

8 Sue McKemmish and Michael Piggott, *The Records Continuum* (Melbourne: Ancora Press, 1994).

9 For multiple views of the archival multiverse, see Anne Gilliland, Sue McKemmish and Andrew Lau (eds), *Research in the Archival Multiverse* (Clayton, Vic.: Monash University Publishing, 2016).

of this book. Up to the point of its formation there was little separation in Monash's programs between agency practices and our research programs. As practitioners lost ground in the battle with electronic recordkeeping issues, however, research into recordkeeping metadata pushed ahead of what was occurring in the workplace. Monash's programs, in turn, became even more research-oriented and the teaching programs were directed at many different professions at both undergraduate and advanced postgraduate level.

Governance has continued to break down in Anglo-American societies, typified by the cynical distrust of politicians shown in 2016 in the Brexit campaign that took Great Britain out of the European Union and the election of Donald Trump as President of the United States. The recordkeeping approach of the 1990s and attempts to address financial incompetence have not had any significant impact on the spread of post-truth techniques or the popularity of cowboys. More than a recordkeeping single mind is needed if governance at so many levels of individual, group, organisational and social operation is to produce more adequate and ethical evidence-based decision-making. A trans-disciplinary continuum-based concern with broad unities across the complexities of governance helped lead to the formation of Monash University's Centre for Organisational and Social Informatics (COSI) in 2006 by Professors Sue McKemmish and Don Schauder. Informatics, at least in this book, follows the Monash approach, signifying a joint approach to the social, cognitive and technical aspects of both information management and information systems design and development. For that reason, if the RCRG can be considered as one parent of this book, COSI can be considered the other.

The research orientation continues at Monash, but the development of recordkeeping informatics is part of the commencement of a return to workplace issues. When in 2008 we began to look for a new records management textbook, we naturally wanted one that was at home with technical, social, and sense-making aspects of the subject in the emerging world of cyber-physicality and not just with electronic recordkeeping. We quickly realised that a prior task was to construct a new disciplinary base. The fact that this book was drafted across two eras of computation helps explain its lengthy gestation period. It bridges electronic means of doing business and the cyber-physical applications of the mobile world of new modernity. It also helps explain why we are so concerned with getting a logical matrix for archives formation in place. The wild west required that more attention be paid in the workplace to recordkeeping within electronic communications and information storage processes, and still does. The wild,

wild west of cyber-physicality is creating an access mess and is stimulating a new and vicious form of warfare. Both electronic and cyber forms of computation require the re-invention of the archive as the still point around which the world turns. Fortunately, the technologies central to the crises might also provide the cure if the powerful cybernetics of nanosecond archiving can be harnessed.

Nanosecond Archiving, Cybernetics, and Master Informaticians

The reviewer who wanted an introduction to the structure and background to this book also expressed enthusiasm for the originality of its approach to Actor–Network Theory (ANT) and information systems design (ISD). This support has encouraged us to push the envelope even further in this preface and hypothesise about the future of our own form of archival network theory that is emerging from writing about recordkeeping informatics. From a continuum archivist’s perspective, informatics widens the notion of governance from its records or information object-centric stance into a process-directed concern embracing archives and records management, information management (IM) and ISD. The twentieth century’s fracturing between and within ISD and IM these days makes no sense.¹⁰ There are many calls for convergence, but, as far as we are aware, this book is the first to revive recordkeeping theories as part of an Actor–Network Theory intent on mending the fractures while simultaneously calling for the further development and expansion of specialisations.

How can we hope to help cure a problem like the many fractured adhocracies across IM and ISD without hindering the expansion of the specialisations? Our answer in this book is an approach to networking in which informatics professionals will need to work collectively in helping each other to assess whether information is the good oil. Without the adequate presence of the single-minded concentration on the recordkeeping processes that produce evidence of actions within the framework of broader IM, we will be left with information sludge and an environment of increasing chaos – an environment that places us all at risk of underhand practices, unwelcome social consequences, and at a professional loss as to how to operate within the reality of increasingly complex digital ecologies.

10 Rudy Hirschheim, Heinz Klein and Kalle Lyytinen, ‘Exploring the Intellectual Structures of Information Systems Development: A Social Action Theoretic Analysis’, *Accounting, Management and Information Technology* 6.1/2 (1996): 1–64.

But, if the recordkeeping single mind operates on its own we know from experience that it will be ignored, at least in Anglo-American democracies.

Accordingly, an understanding of the importance of teamwork emerged from the way the writing of this book was sharpened by the way we were trapped within the uncertainties of a major shift in the idioms for expressing dominant forms of computation. When we began writing this book in 2008, the major buzzwords were ‘electronic’ and ‘digital’; now they are shifting to ‘cyber’ and ‘smart’. One classification system has described the shift as from industry 3 (data management and electronic means of production) to industry 4 (cloud computing as a source of cyber-physical production systems and smart devices using communication mobility as part of the Internet of Things).¹¹ The two methods of production are, however, not mutually exclusive. Electronic information and communication technologies, including email, have gone increasingly mobile. Data warehousing has developed into cyber-physical big data applications.

To some extent the shifting conceptualisation of our dominant technologies masks a much deeper logic to archiving processes, which is exposed by comparing two terms, cybernetics and cyber-physicality. Cybernetics can be defined as ‘the general study of control and communication systems in living organisms and machines, especially the mathematical analysis of the flow of information’ and comes from the Greek κυβερνητικός, *meaning* skilled in steering or governing.¹² For the Greeks, recordkeeping was a cybernetic process at the heart of governance and that has been the case in many societies since then. Cyber-physicality is similarly easily connected to recordkeeping practices. According to the *Wikipedia* entry, in 2016 it refers to networked applications that are ‘deeply intertwined, each operating on different spatial and temporal scales, exhibiting multiple and distinct behavioral modalities, and interacting with each other in a myriad of ways that change with context.’¹³ In this book the analytical facets and building blocks of recordkeeping informatics throughout the history of archives have been intertwined, operate on different spatial and temporal scales, etc.

11 The *Wikipedia* entry for Industry 4.0 explains the style of computation adequately, but as this book shows, the addition of the ‘.0’ version indicator is trendy but intellectually hollow. There have been many versions of industry 4 since its base was set in the marriage of internet and web-browser in the early 1990s, and every complex variation is part of its simplicity.

12 ‘Cybernetics’, *Dictionary.com*, <http://www.dictionary.com/browse/cybernetics> (accessed 4 December 2016).

13 ‘Cyber-physical system’, *Wikipedia*, https://en.wikipedia.org/wiki/Cyber-physical_system (accessed 7 November 2016).

So what is new? The answer, from a recordkeeping perspective, is everything and nothing. The archival multiverse in any era involves the management and control of archival storage across interconnected locations, but these days the control issues are ferociously complex given the advent of cloud computing and the Internet of Things as a dominant form of computation. This book strives to build a new discipline around the logical stabilities while recognising that the logic will be shaped differently within the many complex variations possible using electronic and cyber-physical means of production. The continuum of recorded information is still a singular whole, but its complexities are galloping ahead of its management as an authoritative information resource. That is why this book is both a chip off an old block and yet diverges dramatically from past and present current archival practice. While it is written from the specialised experiences of the long-standing logic of the recordkeeping single mind within business activities, it is part of a wider concern with the dramatic changes occurring in the relationship between technology, archives, and the moral governance of human activity and identity. The archival theory is stable; the dance is different.

Who, ideally, are the nanosecond archivists who can cope with the simplicity of the task of managing the still points of the turning world? In an idealised world of cloud computing it will be the job of all informatics professionals functioning as part of a large and diverse professional grouping in society and across workplaces in ways that will bear comparison with medicine and law. This ‘third’ great profession is the audience for this book. This of course sidesteps the obvious problem – that informatics does not yet exist as a collective of ANTs capable of, for example, springing into action as teams within projects in ways that will help heal the fragmentation and fracturing of last century’s information professions. Will such a powerful professional collective endeavour emerge? That is a question to which pessimistic and optimistic answers can be given.

The pessimistic answer is the easier one to give. Cyber-physicality might be demonstrating that all is archive, but its cyber-logic is off beam. The era of the postcustodial archive has arrived without adequate archival control mechanisms.

Archivists and records managers have not been in the game and no-one has filled the breach, so the frontier of change can only grow wilder. Immediate and widespread professional input into future practices for ethical and evidence-based nanosecond archiving is needed now, rather than in ten years’ time; yet it is hard to see where it will come from. There are many great business applications emerging; but what use are they if

their use is subverted by a wild frontier that is damaging the economic, social, sense-making, and environmental conditions within which all space-time management, mutual association, and fulfilment of life-chances must occur? In this pessimistic scenario, information sludge is beginning to dominate so much of human activity. Networking should be a boon, but too often it channels people into networks that promote their own subjective views or directs them towards poor quality or deliberately false information.

In part, the post-truth approach involves a common reluctance to refuse to address complexity in open and transparent fashion. Cyber-criminals, for example, will find easy pickings if businesses and governments are reluctant to openly discuss the non-technical downside of technological change in precise detail. Openness about the social and cognitive issues in a world influenced more by public relations consultants than reality can threaten their commercial interests or power bases which is why they might want to underplay what is happening. The most economic means to address cyber-crime, however, is likely to be by linking business and community interests and concerns with ethical recordkeeping within team-based and participatory approaches. That requires honest communications that do not hide the facts. Similarly, government and business organisations have been reluctant to openly discuss cyber-espionage and cyber-warfare because it exposes the limitations of existing firewall and encryption strategies. Virtually no attention in business or government is being paid to the longer-term need to re-establish civil recordkeeping informatics behind and beyond the technical interfaces, which means that there can be no solution in sight. Of course things will get worse.

The pessimistic scenario must make any reader wonder if this book is too avant-garde for our original aim of getting a stronger conversation started around the archiving processes needed for better defence of the authoritative and evidential value of information. We are sure a broad grouping of informatics professionals can do better than the old archival groups have done in dancing into new eras, but that is only notional. We are trying to signal something to a wide readership that does not yet exist in identifiable form and which, in proton-form as members of fractured adhocracies, might not receive our message in the first place. As archivists, however, it is equally easy for us to draw on the past for an optimistic alternative scenario that demonstrates simplicity in action. A few hundred years ago the industrial revolution was assisted by a major change in the arrangement of the construction trades. Carpenters, bricklayers, plumbers and

even architects began to be arranged in teams by master builders, enabling factories to be built quickly and economically. We are really only asking for the same thing to occur in relation to the formation of archives. The master informaticians of this century will put together the right teams to look after nanosecond archiving issues. They will be the elite professionals orchestrating the application of a range of trades.

We are aware by using the word elite we will alienate some of those existing practitioners operating in their own mind as professionals. It is a long-standing dilemma in the information professions. Who deserves professional status in Actor–Network Theory – the architect ANT or the worker ANT? For us it must be the master informatician, even though most information professional groups have their membership base at the worker level. This is not, however, a power grab on our part, since this book deals with only one specialisation within an overview of the whole. We hope that in its pages many groups will find the origins of a blueprint for a major archival construction industry and the ‘architect or ant’ dilemma will be resolved within a faculty-based approach. We are confident that the book has a receptive professional audience, including archivists, records managers, systems analysts, information managers, business managers, specialist operations experts, auditors, accountants, and even some retro-active janitors, but it will be up to them to work out ways to work in elite fashion within teams developing or implementing cyber-physical applications. Rather like a sporting team, it is the teamwork that is in most need of being elite.

The biggest single cause we have for optimism about the emergence of an elite teamwork approach to nanosecond archiving is that the greatest opportunities for master informaticians reside in the technicalities of the very cyber-physicality that is currently causing an expansion of the wild frontier. It provides a new idiom for proving the need for a shared philosophy for nanosecond archiving in which everything is intertwined, things happen on different spatial and temporal scales, the modalities of action are multiple, and context is situational, often bringing change rather than stability. The bad news is that cloud computing has rubbed everyone’s nose into the importance of getting on top of the complexities of archiving far too quickly for the evolution of adequate control mechanisms. The good news is that it offers challenges that can and must be addressed simply because the problems for business operations are so fundamental and transparent that the pragmatic emphasis upon application control in this book is hard to argue against.

Conclusion

Within the sweeping traditional canvas of the connection between archives formation and the civic virtue of the ‘moral defence’ of the record, this book has relevance to the governance role of archives *wherever they are formed*, which is what one should expect given that it has emerged from the continuum stable. Its focus, however, is the organisation and the emerging and irresistible mess of information storage in the clouds. Archival ANTs employed by an organisation or used in consulting teams by master informaticians will have their dominant focus on building, maintaining and repairing the Internet as Archives/Records∞. For recordkeeping informaticians operating within this emerging archival field of cyber-physical dreams there will be a good living to be made from being specialists in helping an organisation to manage its affairs over different spaces and times, to manage the mutual obligations required by its business dealings, and to maintain its life-chances. Their functions can include identifying applications that help establish patterns in the chaos, tackling cascading records and communications by bundling activities, and undertaking any other related tasks that help their employers operate within an archival multiverse shaped by the expanding continuum of recorded information.

We can understand the argument that the breadth of ambition in the notion of master informaticians leading elite teams is too grandiose for implementation, but we do not feel that such pessimism fully appreciates a major practical theme in this book. A major thread through this book and through many recent developments in archival practices is the recognition of the need to promote a wider understanding of the archival turn that new technologies are bringing with them represented by our use of the term nanosecond archiving as a still point. A newly fashioned emphasis upon archiving that unites recordkeeping, IM and ISD can bring more order to the presently expanding chaos. Many individuals, community groups, and organisations can be brought back to the time-honoured logic of record-keeping if they can begin to see themselves as ‘bundles of activities’ and can be led from the still point to the complex search for practices that can help them bundle in authoritative and evidence-based form the expanding continuum of communications and records that is so much part of the dance in their turning world.

The more we discussed the recordkeeping informatics project in our grandiose continuum-based terms, the more it became clear that the need to rebuild a disciplinary base was a larger task than we realised. We identified

a growing disconnection between the needs of employers at business, government and communal levels and what information technology has been providing. The emergence of social media using networking technologies also involves a fundamental shift, the impact of which will be much more complex in its parts. Getting hold of only one aspect of any ‘solution’ was a waste of time unless it was part of a fuller attempt to address the future dynamic nature of this genuine complexity. A full overhaul of discursive and non-discursive practices (the way we discuss things and the things we do) was needed beyond any one discipline.¹⁴ Realistically, all we can do is to try to set the ball rolling.

Despite the problems of developing a method across changing views of computation processes, or perhaps because of them, what we present in the following pages certainly has the potential to set things in motion. It presents recordkeeping informatics as a new disciplinary base for dealing with how, in this century, recordkeeping can be connected to the governance of societies and organisations, the way they form and use evidence to make decisions, and the way they build archives that can sustain investigation of past actions. In a simple view there is future in authoritative information resource management and ethical evidence-based recording and decision-making for all informaticians. A focus on nanosecond archiving can help overcome the fragmentation and fractures of dysfunctional forms of professionalism. For a much more complex view we ask the reader of this book not just to read on; please do so, but as you do, work out how you can contribute in your own way to archival Actor–Network Theory, remembering that the dominant records continuum theory of this book is that your practices can shape the future.

14 *Discursive practices* are those relating to discourses (conversations now recognised as being extremely practical), while in broad terms *non-discursive practices* refer to methods.

Part One

The Recordkeeping Single Mind

RETUNING THE RECORDKEEPING MIND FOR THE NETWORKED AGE

1.1 Recordkeeping Informatics as Theory for a Digital Age

Recordkeeping is a survival issue. It has been what holds social groups together and helps them manage things over spacetime. From the first emergence of communal groups it has used an expanding array of information apparatuses. Beginning with paintings, songs, and dance different genres have developed their own complexities. In the business genre, trade from the beginning was managed by techniques such as carving notches on sticks to record transactions. Written script led to an expansion in ways of doing business with each other in commercial and personal forms. In the paper era, recordkeeping became part of our hidden nature. Marcel Proust expressed this in poetic prose:

If I got up for a moment and drew back my curtains to put myself in tune with the light, it was as a composer, who hearing in his head the symphony he is writing on paper scarcely needs to strike a note in order to make sure he is in tune with the real pitch of the instruments.¹

Proust's narrative voice points to a feeling of self-contentment that modern archivists and records managers cannot experience. Paper and what was being composed on it scarcely needed thinking about. So much discourse and many practices were being built around the symphony of recordkeeping in the paper

1 This quotation was used to begin an article exploring the records continuum; see Frank Upward and Sue McKemmish, 'In Search of the Lost Tiger, by Way of Sainte-Beuve: Reconstructing the Possibilities in "Evidence of Me"', *Archives and Manuscripts* 29.1 (2001): 23–43.

era, whereas the modern pitch is digital and all we have is a few snatches of music that have yet to become assimilated. Our routines are disjointed and non-transparent, occurring (or not occurring) behind and beyond our computer screens in ways that can no longer be fathomed intuitively.

Some people did think hard about recordkeeping in the paper era, such as Jean Mabillon the seventeenth-century Benedictine monk who described longstanding documentary protocols and techniques. The diplomatics of mutual association have moved on into a more complex tangle of artistic, personal, social and business communications since then and the shift to digital records compounds the complexity. In the last forty years the expansion in both our apparatuses for recording information and our transactionality has been exponential. We use mobile devices, computers, internet and web-browsing applications, closed circuit television and a host of other storage and communication devices which would have been beyond the imaginings of most people in the 1970s. Everything from refrigerators to wristwatches can be internet-enabled objects (IOTs) and such objects can increasingly be used to launch business processes.

When trying to help archivists and records managers make the transition, a visualisation of the logic of the aggregation processes within our transactions was presented within a clever recordkeeping metadata research project at Monash University in the late 1990s (see Figure 1.1).² It points to the nature of the relationship between recordkeeping and social theory that has been a hallmark of the work of that University's Records Continuum Research Group.³

The model depicts the relationships between events, people and processes for records capture and archival formation. It can be stretched into patterns for different eras or places. In modern patterns for corruption it is even likely to disappear as miscreants rely on the difficulty of proving malfeasance when records are not present. Within Weberian bureaucracies it helps explain the power of registries in which mail was opened at a central organisational point, placed on a file, and incorporated into a workflow. Replies or new items of correspondence were sent from a central dispatch point where flows could be temporarily rounded off or new ones begun.

2 See, in particular, the SPIRT and Clever Recordkeeping Metadata projects outlined at <http://www.infotech.monash.edu.au/research/groups/rcrg/projects/> and documented in the many articles by various authors accessible from each project link.

3 Sue McKemmish, Michael Piggott, Barbara Reed and Frank Upward (eds), *Archives: Recordkeeping in Society* (Wagga Wagga: Centre for Information Studies, Charles Sturt University, 2005), 198–201.

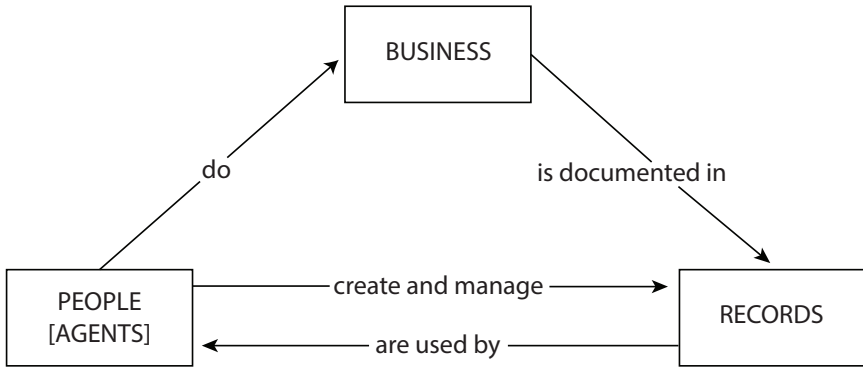


Figure 1.1 A Model for Recordkeeping as Network-based Social Theory⁴

The general problem, from this social perspective, is that recordkeeping-based workflow has yet to find a favourable modern implementation landscape. Instead, it is trying to come to terms with what the Canadian archivist and records manager, John McDonald, described in the 1990s as an information wild frontier similar to the Wild West in the United States in the middle of the nineteenth century. In that instance, non-indigenous settlers colonised the land well ahead of stable mechanisms for law and order. Similarly in the digital era changes to our information and communication technologies are galloping ahead of governance.⁵

In an alternative networking metaphor, parts of the new frontier are particularly dark, a new Barbary Coast. A connected network of agents, however, offers untapped potential opportunities for addressing the dislocation in the processes of governance, so Actor–Network Theories (ANTs) are springing up within many disciplines. In one sense it does not have to spring up within recordkeeping informatics; it is already there in the history of recordkeeping. It needs recommencement. Connectivity and recordkeeping informatics, as the model demonstrates, go hand in hand. Indeed, one of the distinguishing features of a recordkeeping mind, we will argue below, is that it aims to manage records in relationships.

The future pitch of recordkeeping for a networked age, fortunately for our pessimistic view of its current state, is becoming clearer in new social theories about the relationships between societies and information. ANTs are providing a methodological shift for information and systems

4 McKemmish et al. 1999, op cit, p. 12

5 John McDonald, 'Managing Records in the Modern Office: Taming the Wild Frontier' *Archivaria* 39, Spring 1995; 70-79

management, from static point in time singularity to a navigational style, which, by exposing the myriad connectors and actions leading to the instance of information representation at a point in time, enables continuous and authoritative interpretation of that single instance of information representation. Described by November, Camacho-Huber and Latour in relation to scientific visualisation, this could be a description of the general intent of this book:

An isolated image has no scientific referent – but it generates, of course, like all images, a virtual image, the ‘what’ that it is said to be the representation ‘of’. Taken in isolation, an electron microscopic image of a virus, a photograph of a galaxy, and the drawing of a skeleton in a natural history museum, has no specific value (even though they might have powerful aesthetic, pedagogical, or rhetorical strength). If you want to understand what an isolated inscription means in science, you have to reinsert it inside the cascade of other inscriptions out of which it has been extracted.⁶

This is a motif that we will use often, but we will be playing our variations. We are pleased that the rhythm is out there because it means that these variations will sound familiar to some others, but our version needs to be distinctive or we have no particular role to play within Actor–Network Theory. The volume of cascading inscriptions has been expanding exponentially and the explosion of recorded information in the networked age should be of fundamental concern for both archivists and records managers. As Livia Iacovino has written:

The greatest challenge for archivists is to decide to take a continuum view and be involved with records’ formative processes to ensure that records become part of the ‘corporate and social fabric’ or to limit themselves to a temporal role where they are only responsible for the small portion of documentation that has passed the archival threshold.⁷

The archival threshold that Iacovino refers to is the threshold between records in general organisational use and the archives as a place of storage

6 V. November, E. Camacho-Hübner, and B. Latour, ‘Entering a Risky Territory: Space in the Age of Digital Navigation’, *Environment and Planning D: Society and Space* 28 (2010): 588.

7 Livia Iacovino, ‘Archives as Arsenals of Accountability’, in Terry Eastwood and Heather MacNeil (eds), *Currents in Archival Thinking* (Santa Barbara: Libraries Unlimited, 2009), 182.

for records appraised as having long-term value, a linear form of record-keeping functionality present in the paper era. With the so-called front-end of archival formation going through so much flux, and the management of information storage occurring behind and beyond our computer screens and across our internet enabled instrumentation in general, that linear arrangement is archaic for records born in digital form.

A closely related motif to recordkeeping's agent, process and recorded information nexus has slowly emerged in information systems design (ISD) literature, which might now emerge quickly within enterprise architectures. Thus Aakhus, Agerfalk, Lyytinen and Te'eni, in a 2014 article on the need to revisit the nature of such architectures, have written:

A symbolic action perspective for IS has evolved similarly, especially when IS scholars have drawn upon organisational and communication studies. Organisations can now be conceptualised as bundles of activities grounded in language and communication.

(March and Olsen 1976; Suchman 1987; Weick 1979).⁸

Note the vintage of the references. Why has it taken so long for the recordkeeping perspective, which is a major theme of this book, to dawn on systems designers in pragmatic fashion? Surely the precise role of registry operation described above was to bundle activities? The same authors give a clear explanation for what has been delaying research and development into the blindingly obvious truth that organisation can be understood via their bundles of activity. They note that researchers 'have approached information systems as primarily a process of automating data manipulation, transfer and storage'.⁹ In other words, in one of those strange quirks of history, in the 1990s the application platform interface for enterprise architectures was data processing whereas logic would tell any business manager that it should be the business application itself. In this book, the dominant interface is the internet-based business application and this gives enterprise architectures a new meaning revolving around the old recordkeeping task of bundling business activities with particular reference to linguistic and communication processes.

8 Mark Aakhus, Pär Agerfalk, Kalle Lyytinen and Dov Te'eni, 'Symbolic Action Research in Information Systems: Introduction to the Special Issue', *MIS Quarterly* 38.4 (2014): 1190.

9 Aakhus, Agerfalk, Lyytinen and Te'eni, 'Symbolic Action Research in Information Systems': 1188.

Simply to state the above themes of Actor–Network Theory or symbolic interactionism is to raise issues of aggregation that recordkeeping activities have been dealing with regularly over the ages. Again, the issue in this book is not what ISD experts are writing but what variations archivists and records managers should be able to play on this theme. It might be a new motif in IS, but not in recordkeeping history where document aggregation processes have been undertaken within routines that went under such labels as filing. The newness, however, is present for everyone in the rate of flow and the apparatus for communications which take us beyond the traditions of the paper era and on to the need to reinvent recordkeeping as recordkeeping informatics.

1.2 Recordkeeping Informatics and the Recordkeeping Single Mind

When we coined the term recordkeeping informatics in 2009, we were trying to provide a label for the reconstruction processes ahead for records management and archival practices in the digital era. The old disciplinary base established under paper had collapsed. Archivists and records managers often seemed to be focusing on digitisation of paper while drifting further and further away from delivering a wide range of recordkeeping services in modern digital environments. We wanted terminology that signaled a degree of difference from established approaches to the management of recorded information, while still acknowledging the central role of aggregation processes using modern information systems and technologies. Recordkeeping informatics provided a clear point of departure from the philosophy that the principles to be applied to digital records are exactly the same as in the paper world.¹⁰ They are not, and attempts to do so result in frustrating failures.

We wanted to get back to a process-oriented approach to recordkeeping (one word) which does not split the making and the keeping of records and offers multiple views of the way we create, capture, organise and pluralise records. We were attracted to basic definitions of informatics, with one in particular standing out for our purposes:

Informatics is the science of information. It studies the representation, processing, and communication of information in natural and

10 Terry Cook, 'Electronic Records, Paper Minds', *Archives and Manuscripts* 22.2 (1994): 300–329.

artificial systems. Since computers, individuals and organizations all process information, informatics has computational, cognitive and social aspects. Used as a compound, in conjunction with the name of a discipline, as in medical informatics, bio-informatics, etc., it denotes the specialization of informatics to the management and processing of data, information and knowledge in the named discipline.¹¹

As this definition makes clear, many disciplines can take up informatics as a concept. This means that it can capture the richness, complexity and variety of skills, practices, theories and knowledge that power the systems of the information age without denying a place in the sun for any particular specialisation. The informatics approach conceptually is an enabler of greater flexibility in systems and information management so that they may better balance, and be responsive to, individual, community, business and government recordkeeping needs. The social and cognitive aspects give depth to topics like human–computer interaction and its more academic counterpart, symbolic interactionism. Those in the named discipline have to be able to deal with technological and process innovation, be aware of the risks and opportunities such innovation brings, and be able to maximise the human benefits they can bring.

We added in the concept of a recordkeeping single mind when we delivered a conference paper and published a follow-up article on recordkeeping informatics in 2012 and 2013.¹² It comes from an Australian Law Reform Commission (ALRC) report in 1997 recommending a co-coordinated ‘single minded’ approach bringing together records management and archival administration. The recommendation was based on advice of archivists who foresaw the major challenge nanosecond archiving was about to pose for bureaucratic administrators. It was however too avant-garde for them to comprehend at the time and was not followed up upon.¹³

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- 11 Michael Fourman, ‘Informatics’, in *International Encyclopedia of Information and Library Science* (2nd ed.), John Feather and Paul Sturges (eds) (New York: Routledge, 2003), 237–244 (Available, as Division of Informatics, University of Edinburgh, Informatics Research Report EDI-INF-RR-0139, at <http://www.inf.ed.ac.uk/publications/online/0139.pdf> (accessed 3 October 2016)).
 - 12 Frank Upward, Barbara Reed, Gillian Oliver and Joanne Evans, ‘Recordkeeping Informatics: Re-figuring a Discipline in Crisis with a Single Minded Approach’, *Records Management Journal* 23.1 (2013): 37–50.
 - 13 Australian Law Reform Commission, Draft Recommendations Paper 4, Review of the *Archives Act 1983*, accessed contemporaneously at <http://www.austlii.edu.au/au/other/alrc/publications/draftrecs/4/ALRCDRP4.html>. The final report is strongly critical of Commonwealth Government recordkeeping; see *Australia’s Federal Record*:

In these writings about developing recordkeeping informatics as a disciplinary base addressing the aggregation of recorded information, we pointed to the crises the absence of a recordkeeping single mind was causing. Bureaucrats accidentally burned down houses and killed people,¹⁴ or if they are cemetery administrators lost track of where the bodies were buried.¹⁵ Even with all the wonders of modern information and communication technologies to draw upon, gross mistakes occur too often. Major failures in governance that matter – e.g. transparency, accountability, crime, and corruption – are becoming commonplace.

A host of wicked global problems, like climate change and terrorism, are running away from adequate management and part of the problem is, paradoxically, the expansion of information in uncoordinated and fragmentary fashion. The information age is not delivering maximum benefits and the emerging networked age offers ways of addressing its failures. We argued that the joint operation of archival administration and records management had moved from a central position within the paper-based information landscape over centuries to marginal information spaces despite the exponential expansion in the production of recorded information arising from and about our actions.

In an age of networking, the singularity implies that the recordkeeping mind has to operate with other single minds. You create a stronger whole by harnessing the differences, not by ironing them out or by allowing the temporarily stronger fragments to ride roughshod over others. It also is easier to show how the modern information age undervalues the recordkeeping single mind once you start making it more visible as a specialisation to other information professionals. This approach to Actor–Network Theory was not a sophisticated part of our discussions until 2012 when one of our number, Barbara Reed, tabled an item by Bruno Latour.¹⁶ It was an article

a Review of Archives Act 1983 (Australian Law Reform Commission Report 85) (Sydney: ALRC, 1998), Available at <http://www.alrc.gov.au/report-85> (accessed 3 October 2016).

- 14 Ian Hanger, *Report of the Royal Commission into the Home Insulation Program*, August 2014. Available at <http://www.homeinsulationroyalcommission.gov.au/Documentation/Documents/ReportoftheRoyalCommissionintotheHomeInsulationProgram.pdf> (accessed 3 October 2016).
- 15 M.E. Ruane, 'Chaos at Arlington Cemetery: Mismarked Graves, Dumping of Urns', *Washington Post*, 11 June 2010. Available at <http://www.washingtonpost.com/wp-dyn/content/article/2010/06/10/AR2010061005638.html> (accessed 3 October 2016).
- 16 Bruno Latour, 'Gabriel Tarde and the End of the Social', in Patrick Joyce (ed), *The Social in Question, New Bearings in History and the Social Sciences* (London:

paying homage to Gabriel Tarde for having seen, almost a century before Latour, that the parts are always more complex than the whole. From that point we began to link our themes to a grand project to heal the divisions that exist in and between information management (IM) and information systems design (ISD). They should provide a simple whole. At the level of the parts, the system and information management complexities need to be teased out on a part-by-part basis.

The shift in our approach was confirmed when a colleague, Henry Linger, gave us several items from information systems and design literature which confirmed that the split was deep, creating parallel universes. In one item from the 1990s, Rudi Hirschheim and others described the information systems design discipline as a fragmented adhocracy.¹⁷ The same fragmentation and the dominance of particular fragments is a feature of information management during the last half of the twentieth century, with one clear example being the split that developed between archives and records management. Compounding the feeling that IM and ISD are not operating in the same universe as the world in which the bundling of activities can define an organisation, there has been a major split between the content-based and individual information objects approaches of IM and the more fluid systems approaches in ISD. It is not simply a matter of difference and diversity; the product and the process are at a disciplinary arm's length from each other.

With the introduction of ANT into our discussions, in conjunction with work by Evans, Reed, and others on wind tunnel data in a research project, our own conversation became more comfortable with the workplace and IS attempts to get beyond the dominance of big data.¹⁸ We started to see more fully that the fragmentation of information management and information systems development holds back the evolution of more holistic forms of informatics that are needed to address competent administrative behaviour, governance and major global problems. The sharp division between information managers and systems designers, between information architectures and enterprise architectures, and between big-data and end-product

Routledge, 2012), 117–132.

17 Rudy Hirschheim, Heinz Klein and Kalle Lyytinen. 'Exploring the Intellectual Structures of Information Systems Development: A Social Action Theoretic Analysis', *Accounting, Management and Information Technology* 6.1/2 (1996): 1–64.

18 Joanne Evans, Barbara Reed, Henry Linger, Simon Goss, David Holmes, Jan Drobik, Bruce Woodyat and Simon Henbest, 'Winds of Change: A Recordkeeping Informatics Approach to Information Management Needs in Data-driven Research Environments', *Records Management Journal* 24.3 (2014): 205–223.

information management have been taking us into a world where make-believe becomes the reality. When you break information management off from information system design then words mean exactly what professional groups want them to mean. You can protect professional positions rather than creating a reality in which products and processes should be inextricably engaged with each other and in which enterprise and information architectures need to bundle and build activities in ways that co-mingle business records, archives, information and data. That, at least, was the direction our conversations were taking us.

Informatics is a healing word that can address these fragmented adhoc-racies. On its own it has general meaning, but shuffle another word in front of it and it becomes a specialisation. Difference can be respected, but all involved can acknowledge that they share cognitive and social tasks using the same technologies. We will look closely at this ability of informatics to handle both disciplinary convergence and divergence in Chapter 7 (on continuum thinking). When you shuffle recordkeeping in front you create a single-minded approach to recordkeeping as a fragment operating in conjunction with other fragments. We had hopefully uncovered a networking-based way of addressing a major theme in our articles – authoritative information resource management.

1.3 Authoritative Information Resource Management

Many sociologists have had a sharp understanding of recordkeeping as social theory and in this book we will regularly play variations on the rhythms of Anthony Giddens' codification of allocative and authoritative resource management. To cite him almost word for word, allocative resources refers to:

- material features of the environment (raw materials, material power sources),
- means of material production/reproduction, instruments of production, and
- produced goods (artefacts created by the interaction of the other two points).

In relation to information, this is an area of massive expansion in both the amount of material being produced and the tools available for its production. According to Giddens, authoritative resource management consists of:

- the organisation of social time-space (temporal and spatial constitution of paths and regions),
- the production/reproduction of the body (organisation and relation of human beings in mutual association), and
- the organisation of life-chances (constitution of chances of self-development and self-expression).¹⁹

We will be arguing that in information resource management the authoritative approach has become the poor cousin. The means of production is charging on a long way ahead of our ability to manage it authoritatively, leading to crises in spacetime management, disruption of mutual associations, and, for too many organisations and individuals, a diminution of their life-chances. It is a trilogy that we will repeat because we think it is often being lost from sight. That does not mean we underrate the vibrancy of allocative information resource management, but telling people how to produce more recorded information or discussing how they can move it around quickly and globally is a job for others. We can see the attraction of going with the flow and living within and trying to capitalise upon emerging communication and information technologies, but as advocates for recordkeeping informatics we are wearing the colour of authoritative resource management.

Ironically, it was authoritative resource management in the paper era that often was done naturally because of intuitive understandings of recordkeeping processes. Aggregation processes just happened within file management or via the construction of series of information resources from journals to paid claims. Registers and indexes brought the parts into a coherent whole. Recordkeeping has now disappeared behind and beyond computer screens in an often chaotic frontier being extended by people with limited understanding of authoritative resource management. Its intuitive base has collapsed.

The collapse shows up in the way many issues are being mismanaged over spacetime within cultures that value the here and now. Much of the information in such cultures is sludge and taking it too seriously can lead to disastrous consequences. In regard to humans and their mutual association, archivists like to point to the connection between the early formation of archives in Greece and Italy and the development of robust civilisations, the emergence in Europe of the notary tradition and the rule of law and order,

19 Anthony Giddens, *The Constitution of Society* (Cambridge: Polity Press in association with Blackwells, 1984), 258.

or the significance of recorded information as evidence in twentieth century civil societies.²⁰ Such illustrations of the relationship between records, archives and governance demonstrate the importance of diplomatic mechanisms for mutual associations. The technologies have changed however and the productive power of modern social media enables us to associate in many new and exciting ways. It also brings with it cyberbullying, the spread of crime, violence, corruption and terrorism, and the valuing of the present moment within a cascade of documentation that enables politicians, managers, and technocrats to regularly spin the narrative to gain short-term advantage. For whatever reason (and there are many) governments and organisations regularly forget that actions have consequences that can multiply and expand.

Recordkeeping has direct impacts upon our life-chances. Those impacts can be supportive or adverse. Our version of recordkeeping informatics in this book is grounded in ethical forms of implementation similar to Giddens' healthy view of authoritative resource management, but record-keeping on its own is morally indifferent. Records can breach privacy and expose someone to threats from others, or they can provide them with much needed information. They can help protect people from terror or generate it. Totalitarian governments keep detailed surveillance records about their citizens and law enforcement agencies in any form of government will use recorded information arising from transactions to help catch criminals. Banks have to be good recordkeepers. If not the financial system can collapse, as it did in the United States a decade ago when the last major global fiscal crisis was hatched by financial institutions that put the production of their own wealth a long way ahead of authoritative information resource management. In doing so they shot themselves and everyone else in the feet – something that financial institutions pursuing short-term advantage seem to do every so often when their regulators forget what can happen if quick profits are the goal.

In short, authoritative information resource management provides ethical variations on a common theme illustrated above in Figure 1.1. The way records are captured and how archives are formed from the web of relationships in which humans co-exist will control the shape of societies. Unethical recordkeeping supports totalitarianism. Recordkeeping informatics will be needed to support civil societies. Corruption flourishes in

20 Adrian Cunningham, 'Archival Institutions', in *Archives: Recordkeeping in Society* (2005), 21–50.

poor recordkeeping environments. The variations on recordkeeping tunes are multiple and the dominant forms depend upon time, place, and the ethical shape they take.

1.4 The Topologies and Topographies of Aggregation

One of the motifs in this book plays on the tensions that exist between topologies and topographies. A topology is a logical shape that transcends time and place. For example, there were logical shapes or patterns for managing cascading inscriptions in the paper era dating back to the film (the threading of documents in files) and the series (the aggregation of files and individual objects in sub-sets). A topography refers to the particular time and place in which records are being managed, which might or might not share practical similarities with other times and places. Topographically, archives and records management activities have shifted from a central position within the information landscape to marginal information spaces over the last seventy years. Is that because much of the logic of what made recordkeeping a central activity to business is no longer relevant, or is it because the logic has not yet found its feet in a new age?

As an example of the difference between a topology and topography, a 2015 account of Actor–Network Theory criticised early versions for not catering for the unfolding nature of reality, for not being in touch with the limits of knowledge, and for simply fitting in with the status quo.²¹ Since then it has diversified and become much more evolutionary as different professional groups have begun to develop their own versions, something we are attempting to do in this book. With so many possible variations, what is the recurring logic of ANT? We cannot answer that question – it is not even remotely our area of expertise – but we will be answering it for an ANT version of recordkeeping informatics. We have already:

- referred to the logic of the bundling of activities, communication chains, the role of linguistics, and the emphasis upon cascading documents
- flagged our interest in the significance of aggregation processes for authoritative resource management

21 ‘Actor–network Theory’, *Wikipedia*, https://en.wikipedia.org/wiki/Actor%E2%80%93network_theory (accessed 3 October 2016).

- recommended building an informatics approach intermingling social, cognitive and technical elements, and
- made the very large claim that informatics can help give coherence to the currently fragmented state of information management and information systems design without suppressing the fragments.

We make the even larger claim in the last part of this book that informatics can provide the sort of common base for expansive forms of professionalism that is usually only seen in the major professional areas of medicine and the law.

That is just the topology, a theoretical base for a network. We think it is powerful, but we are not claiming it will easily find places for implementation. In fact we will argue that most modern topographies are inhospitable.²² In Australia in 2015, for example, Telstra built part of a marketing campaign directed at small businesses by promising to help them with their business applications. They claimed many businesses had not converted to the paperless office and they could show them how to do so using apps that they were marketing. From a recordkeeping informatics perspective they were promoting vapourware. The main app in their campaign was Docusign, an electronic signature application.²³ While the product is certainly a quality ‘business app’, it is directed at a single document style referent, whereas cascading inscriptions are much closer to Telstra’s core business. Single-referent digital tools for documents have existed for thirty years or more, and that is all they are – single-referent tools that some people think can convert others to the paperless office but on their own have never done so. When leading telecommunication providers do not understand modern challenges to the bundling of activities within the inscription processes of the communication chains they provide, just who does?

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- 22 One example of an unsuitable topography, discussed in Chapters 9 and 10, is enterprise architecture and its twentieth-century variants, which placed data-processing application platforms and interfaces between business activities and the direct recording of action by agents. Such methods were usually based on leviathan information systems design techniques and lack the agility needed for the ongoing management of flexible internet-based business applications which require architectures that have yet (in 2016) to be formally regularised.
- 23 ‘How Business Apps Help Improve Productivity and Reduce Costs’, Telstra marketing feature in *The Age*, 1 June 2015, 24. The title is misleading because they are providing communication services that need to be applied in particular contexts, not business-based ones.

The ignorance of business applications in our telecommunication companies reflects professional, management and technocratic defects in our organisations. One can assume that in such organisations no-one is explaining the real challenges of the paperless office for business operation and no-one is telling them how to address cascading documentation using recordkeeping-based networking theories. The necessary single mind that can develop such explanations is missing. This absence is being compounded by the divided voices of information management and information systems and design specialisations. Both the absence and the fragmentation allow misconceptions to flourish.

Remedial action will not be helped if some older management trends still linger around in our organisations providing unsuitable topographies. In the 1980s Tom Peters and Bob Waterman in their book *Search for Excellence* argued that documentation is clearly identified as a feature that is *not* present in companies with the strong cultures characteristic of excellence:

Without exception, the dominance and coherence of culture proved to be an essential quality of the excellent companies. Moreover, the stronger the culture and the more it was directed toward the marketplace, the less need was there for policy manuals, organization charts, or detailed procedures and roles.²⁴

They were looking for innovation, yet new methods never come fully formed with manuals, charts, procedures or other trappings of a Weberian bureaucracy. However, if innovative companies do not have routines governing their recordkeeping processes, both logic and real-world experiences would suggest that over spacetime they will be characterised by endemic failure. They will have no rules for constructing and bundling records of their activities, and if they do not bundle well, we suspect many organisations will die off or relocate to the Internet's Barbary Coast. An innovative Peters and Waterman approach can massage the bottom line briefly, but in the long term if it suppresses authoritative information resource management it can bite hard into everyone's well-being producing:

- excellent rogue innovators, such as Enron, a company that helped cripple California economically,

24 Tom Peters and Robert Waterman, *In Search of Excellence: Lessons from America's Best-run Companies* (New York: Harper and Row, 1982), 75.

- equally innovative rogue financiers, like the barbarian Madoff brothers, whose investment scheme gobbled up the retirement funds of tens of thousands of Americans, and
- the erratic privacy protection policies (and erratic relationships with governments) of truly innovative companies like Google, Facebook, and Twitter as they look for business models that can help them survive and conquer.

We discuss managerial and technocratic failings at many points in this book but we are not gloomy. Innovation and new business models are as much part of our thinking as that of Peters and Waterman, but our approach has an authoritative information resource management component. The Barbary Coast must not win out in the long term. There is a suitable topography for managing the innovation of new business models emerging. Elements of it are likely to go under the label of agile or nimble computing. In recordkeeping informatics the long-winded label of *internet-based business applications* is needed, by which we mean applications that deal authoritatively with cascading documents. They will use single document style referent apps such as DocuSign within their boundaries, but they offer much more. They are an enhancement upon the sort of applications you are likely to encounter if you register to attend a conference, submit an article for publication to a journal, or engage in any activity that controls a chain of communications, connects to a range of activities, and can allow for multiple points of legitimated access.

Agile computing, from a recordkeeping informatics perspective, has unlimited scope for ongoing research into and development of business applications. We will make many suggestions and present ideas about how to go about such research and development work, but one major logical motif crucial for developmental purposes that we have not yet introduced is the concept of fractalisation. We need to find recurrent patterns for applications so that they can be modularised and tailored for use by individual organisations. One-size-fits-all approaches are anathema to agile approaches to computing, but nor can organisations be constantly reinventing the wheel. The technologies for managing fractals as business applications are already present in digital information ecologies within, for example, plug-and-play information architectures. Such architectures can enable backward and forward compatibility (a core archival authoritative information resource management value) to be present when modules are plugged in or replaced by new modules. In other words an hospitable topography has emerged; what is

missing are the prototypes of modules that can be downloaded from an application store so that organisations can begin to see just what they are missing out on in a world that values information and data but has too often lost its recordkeeping mind. Recordkeeping informatics offers an authoritative route to the paperless office.

1.5 Containing the Transcendence of the Continuum of Recorded Information

Continuum thinking provides the metaphysics and the mindsets by which practices can rise above the nature of physical recordkeeping. As we will discuss in the next chapter, in Australia records continuum thinking in the middle of last century provided a transcendental overview of the logical need to unite archives and records management. Organisations like the Commonwealth Archives Office of Australia built an approach that knitted together the physicalities of agency recordkeeping and subsequent archival custody within a seamless and pragmatic approach to the formation, management and transfer of series of records.²⁵ The methods that were developed captured records as they expanded over time and the intent of forming archives was there from the beginning.

A similar transcendently pragmatic approach to the metaphysics of the whole and the expanding complexity of the parts is present in our discussions of a method for building recordkeeping informatics that will work in this century. We settled upon two basic building blocks – continuum thinking and recordkeeping metadata. They can bring the monistic whole (the continuum) together with the monads (the complex parts) in the way that nothing else can do.

Continuum thinking is transcendent, sitting above or outside of particular times and places. It is also varied, but much of its logical shape can be seen emerging in the first two decades of the twentieth century through the writings of minds such as Albert Einstein, Samuel Alexander, A. N. Whitehead, Henri Bergson and Gabriel Tarde, all of whom were inspired by the notion of ideas and things as moving forces.²⁶ You could understand an expanding universe by looking closely, and in scientific

25 Sue McKemmish and Michael Piggott, *The Records Continuum* (Melbourne: Ancora Press in association with Australian Archives, 1994).

26 Frank Upward, 'The Archival Multiverse and Eddies in the Spacetime Continuum', in Anne Gilliland, Sue McKemmish and Andrew Lau (eds), *Research in The Archival Multiverse* (Clayton, Vic.: Monash University Publishing, 2016).

fashion, at the complex interaction of the parts. Their logic has been kept alive in mathematics by writers such as Imre Lakatos, who argued that expanding specialisation meant loss of contact with critiques from those with other parts to play in relation to the whole,²⁷ and Benoit Mandelbrot who identified patterns in expanding complexity.²⁸ In French literary philosophy, the Bergsonist notion that all is archive was enriched by thinkers such as Jacques Lacan (a topological approach to psychoanalysis) and Bruno Latour (the need to look hard at complexity). The postmodern gang of four as they have been called – Jean-Francois Lyotard, Michel Foucault, Jacques Derrida and Gilles Deleuze – stretched Bergsonism concepts of the archive in many different directions as a producer of sameness, diversity and difference.

So can a summary of the logic in continuum thinking be harvested from a century of thinking? It is many things and should never be pinned down because it is about motion, unless, Einstein fashion, the generalisations are about motion itself. Continuum thinkers in recordkeeping informatics will accept exponential expansion, probe chaos and order, look for useful fractals across and within the complexity at different levels, and will understand that change is generated by unexpected connections within complexity. When observing movement, it will always help to make clear your point of observation, as we have done elsewhere in this chapter in relation to topics such as ANT and will do in the next chapter, which is a short kinetic history of recordkeeping over the last hundred years.

If you accept the presence in our daily lives of an expanding continuum of recorded information as a simple whole, how do you get focused enough to manage its runaway complexity? In the twentieth century the specialisations drew boundaries around themselves. It did not work, or at least it did not work reliably over spacetime, but what, from a containment of complexity viewpoint, replaces boundaries? In this book, a containing focus has been provided by four thresholds common to both IM and ISD tasks. Those thresholds are the creation of inscriptions in documented form, the capture of these inscriptions as records equipped for spacetime travel, their organisation as an archive, and the threshold of pluralisation when they become part of what is now starting to be called an archival multiverse. In the digital era those thresholds can be crossed instantly in a process we describe,

27 Imre Lakatos, *Proofs and Refutations* (Cambridge: Cambridge University Press, 1976).

28 Displays of Mandelbrot fractals are widely available on the Internet; a tribute song by Jonathon Coulton (<https://www.youtube.com/watch?v=gEw8xpb1aRA>) points to the significance of their conceptual base.

below, as nanosecond archiving. You have a chance during ongoing creation processes to set up the future management of information objects and if you miss that chance it will not return.

The chance has to be taken within the blending and merging of a host of influences, including data management, cultural heritage, recordkeeping, publishing, text management, forensic studies of past actions and events, semiotics, hermeneutics, systems design, or any other area impinging on our information and communication processes. The most difficult area of these is, we believe, the recording of action, precisely because it is so diverse a field of endeavour and so many possible structures for nanosecond archiving exist. Ultimately, the containment of expanding complexity will depend upon the implementation of our second building block, recordkeeping metadata.

1.6 Using Recordkeeping Metadata to Manage the Contingencies of Situated Context

Recordkeeping metadata pragmatically provides a major means for producing outcomes in particular instances. It can help manage the physicality of the processing of objects in real time, including aggregating them with other information objects and moving them and their aggregates into other times and spaces. Together, the building blocks can be used to illustrate and help heal the fragmentation of IM and ISD activities.

In our hands, recordkeeping metadata refers to the data-structuring processes by which any and all information objects and systems can be aggregated and managed over spacetime. It controls the pragmatics for crossing the aforementioned thresholds of creation, capture, organisation and pluralisation within business applications. The goal is to strive to ensure that the stories of transactions can be told by linking documents together and can do so as widely and as long as is required. You need those documents that tell the story of the business unfolding as the action takes place to be aggregated, while excluding the extraneous clutter of documents that might deal with similar subjects. These days you can use the techniques of big data to search the clutter, but the bundling processes should aim to enable the whole story to be presented to a user showing the actions, but do so in a way that minimises information overloading.

Most information managers and information systems designers understand that metadata schemes are essential to control the chaos of the complexities of the information parts with which they deal. There is a tendency, however, to shy away from the expanding complexity of cascading

inscriptions, focusing more upon the single referent, whether it is the single information object (a regular focus in information management) or the single system (the most elemental focus of information systems design). Specialists have naturally gravitated to considering metadata issues in relation to things they managed within their specialisations, but this will not produce schemes that are relevant to the unbounded and expanding continuum of recorded information, either in its parts or across its entirety.

Archivists and records managers, for example, have produced records metadata schemas that deal with the sort of things that were once held in paper form on shelves and are now held in digital form on servers, or are accessible using them.²⁹ Records or archives metadata helps produce and place individual objects and, while that is useful, in the competitive array of metadata schemas it struggles to gain attention. Dealing with complexity requires schemas that are in tune with both the logic and the situated context of the parts in contingent fashion and only at research level has the archival profession developed them.³⁰ In applications archivists still look away from that complexity and adopt simple strategies, such as focusing mainly on end products of our business activities. When this happens, the proof is in the pudding. The repositories that archivists and records managers have created will float off into more remote information spaces than they once occupied and the recordkeeping territory involved in bundling activities within communication chains will be turned over to cloud computing and those masters of cyberspace (but not of recordkeeping informatics), such as Microsoft, Google, Facebook and Twitter.

We were careful to say that this was our view of metadata. Chapter 8, on recordkeeping metadata, will draw attention to the Tower of Babel that is the discourse on metadata when viewed across the different IM and ISD fragments. We will show that recordkeeping metadata has a broad relevance, which, like continuum informatics, can be a healing force across the fragmentation of views. Its data elements help give authority to many other schemas, which is hardly surprising given that recordkeeping is a universal activity directed at authoritative information resource management. It deals with data about actions, moments in time, and the source, transmission and web of relationships that are part of the ongoing formation of recorded information. In its pragmatics, recordkeeping metadata has to be agile and

29 See, for example, the technical report, ISO/TR 23081-3:2011, Information and Documentation: Managing Metadata for Records, Part 3, Self-Assessment Method.

30 See <https://www.monash.edu/it/our-research/research-centres-and-labs/rcrg>

flexible, and able to be applied in the real world of complex applications. It should strive to maintain, *when deemed necessary*, archival trails across the flux of change. We emphasise *when deemed necessary* because it is a complex task. You need to build and maintain documentation over time that still retains some contact with the occurrences that gave rise to it in the first place, and attempts to universalise this process would be foolish. In digital information ecologies this archival trail has to be built selectively and progressively as objects move through spacetime, in accordance with a range of variables that need to be assessed, including organisational cultures, the business processes themselves, and access needs.

Within continuum thinking, in which everything in a sense is peripheral to everything else, the position of the observer becomes crucial and can take us beyond the babble caused by disciplinary fragmentation. We suggest addressing different observation points by the shuffling of words in front of *informatics*. Different specialisations will need to come into play according to the complexities involved in particular business applications. Information systems design thinking is now beginning to show signs of investigating the fluidity and the multiplicity of communicated inscriptions, and information management needs to rethink the questions raised by the same phenomenon. One of our motifs is that recordkeeping informatics can help heal the fracture by drawing attention to the need to bundle activities in recorded form within communications chains, and that formerly intuitive process now require interdisciplinary skills and knowledge held together by what needs to be a common interest in recordkeeping metadata.

The strategies for balancing contingency and containment presented in this and the previous section are general ones; another element of containment in this book is our focus on organisations. Within organisations, whole/part tensions are almost always present in the value they place upon bottom-up learning based on experience and top-down management control. The tension involves balancing the complexities actually being encountered during business operations by those at the coalface with the simplifying goal-setting approaches of modern forms of management. Some managers and technocrats even hope to implement large-scale organisation-wide information systems by standardising formats, controlling business processes, dominating strategies and structures, determining relationships with suppliers, and trying to work within twentieth-century information or enterprise architectures for the dissemination and retrieval of recorded information about an organisation's actions. Such forms of organisational

control are under threat from the clouds, as we will demonstrate in Chapter 5 when we look at access to electronically stored memory.

Access to records is becoming a particularly wicked problem, because the general (although qualified) right of organisational control over access is coming into sharp conflict with the way so much technological change facilitates wider forms of access. As we noted above, records managers and archivists have sidestepped the accelerating complexity of access issues by looking away from it and the recordkeeping mind has gone missing in many organisations. That does not mean records managers and archivists do not understand the problem. Whole/part relationships have been particularly important in the development of records management standards. Here is a statement from the recently revised International standard for records management issued in Australia as AS 15489, which makes this clear:

The management of records ensures that they are:

- a) created and captured to meet requirements for evidence of business activity; and
- b) managed appropriately over time to meet changing requirements.

And:

Records requirements are based on an analysis of business context and activity ... and are derived from:

- a) business needs;
- b) legal/regulatory requirements; and/or
- c) societal or community expectations.

A lot can be read into these carefully chosen words. Implicit within this statement is records management as a business-based whole encompassing in agile fashion the aggregation of records across all business activities. More explicitly, it points to the necessity of coming to grips analytically with the complex and circumstantial needs, requirements and expectations of the parts within which the aggregation processes will occur. The reference to social and community expectations is a diplomatic one supporting organisational control based on civil rather than barbaric methods of enforcement. It is a matter of authoritative approaches to our mutual associations that enable transactions to occur – an age-old feature of recordkeeping.

The above extract from the revised Australian standard is a statement of intent, and is a long way from being implemented. The potential, however,

is there for organisations that do not fear adequately regulated forms of access. A focus on authoritative internet-based business applications, for example, can put them in touch with the complexity of their own business processes (see Chapter 4), can more readily support the development of adequate recordkeeping cultures (see Chapter 3), and are more likely to be able to support adequate forms of access at the necessary level of complexity (see Chapters 5 and 6). In other words recordkeeping informatics is itself a form of containment using three forms of analysis which are fed by and feed into continuum thinking and the pragmatics of recordkeeping metadata.

1.7 Informatics and Professionalism

Another motif in this book is the amateurish manner in which the potential of modern information and communication technologies for ethical approaches to authoritative resource management is regularly ignored. Indeed we will devote a whole chapter to informatics professionalism and the cult of the amateur, to use a phrase coined by one of the insider critics of internet technology, Andrew Keen.³¹ Our use of his term should not be taken as an endorsement of his work. As with all of our motifs, we are putting our own perspectives, but are grateful that others are playing similar tunes. In our case, by pointing to the failings in authoritative resource management in the development of internet technologies, we are describing an obvious weakness in the early years of our networked age, one which we hope will prove to be ephemeral.

The need for improvement is presently being indicated by issues as large as cyberwarfare and the collapse of faith in democracy and as small as the administrative bungles and episodes of corruption that feature in news media every day. Establishing an ANT version of recordkeeping informatics will, however, depend upon informatics professionalism. We would like to think others will also strive to arrive at more adequate approaches to authoritative information resource management. The fragmentation of information management and information systems development groups within and from each other has to be overcome. All groups still have too much of the last century on their backs.

Our model for informatics professionalism is the emergence of a megaprofession which is similar to medicine and the law. It will be capable

31 Andrew Keen, *The Cult of the Amateur: How Today's Internet is Killing our Culture* (New York: Doubleday, 2007).

of covering massive and expanding diversity without disintegrating or promoting grey sameness. A few elderly archivists or records managers might still have had grounded experience with both the management of information objects and with recordkeeping systems design but, as we will argue in the next chapter, they are a dying breed. The professional groups for the management of records and the design and development of recordkeeping systems became as disconnected from each other as the broader but related areas of information management and information systems design. It is easy to say that many archivists and records managers have not stepped up to the mark in effective ways to assert the relevance of their experience and knowledge in creating, bundling, and managing organisational records across all of an organisation's activities. They have lost contact with this core form of recordkeeping functionality, but they have been handicapped by the major problems they have had to face in moving from one era to another, their subordinated positioning in organisations that have had to increase expenditure upon data and information processing and, perhaps more than anything else, by the lack of a modern disciplinary base for their work.

The absurdities that are beginning to be produced by the division between records management and archival administration can also be used to expose the format-induced blindness which insists on creating division between records (often characterised as a paper issue) and data in information systems. For example, Vivek Kundra, the first Chief Information Officer to the US government, recently spoke of the need to transform from 'systems of record' to 'systems of intelligence'.³² The separation of records and intelligence is part of a past that led to the blunder of invading Iraq a decade ago on the false grounds that it had a weapons of mass destruction program. If you cannot see the connections between intelligence and records you are the sort of thinker who helped unleash an expansion of virulent destruction and terror in Iraq, Syria and beyond. This is unfair to Kundra, or is it? He can be presumed to be reflecting a peculiarly American notion of records but, if so, such absolute and total disregard for what records do, and should do, and their relegation to a symbol of things that are old and not useful is very disturbing. These views, coming as part of the rhetoric of reinventing government for the digital world, must be countered by clear statements of the value propositions that recordkeeping informatics can bring to the digital world. These include: that organisations can be viewed as bundling

32 Vivek Kundra speaking at the Digital Innovation Forum, University of Technology Sydney, 27 March 2015 (<https://www.communications.gov.au/what-we-do/internet/digital-initiatives/government/digital-innovation-forum> (accessed 4 October 2016)).

mechanisms for activities; that digital services are based on authoritative information; that such information is the new oil; that such information drives innovation; and that the health of business activities depends upon the management of communication chains using recordkeeping techniques. The relationship between digital recordkeeping and robust means of assuring the recordkeeping components of all information resources is part of a sustainable and civil future.

Records managers and archivists need to start developing enough fire in their belly and faith in their ability to challenge those who devalue recordkeeping processes, even if they are as powerful as a Chief Information Officer of the USA. Challenging those who seem to have no comprehension of the close relationship between records and adequate intelligence is an easy task. A much more fundamental and complex recordkeeping informatics challenge can be found in a problem that any organisation engaging in global operations faces every day. How does it respond to the expanding global game of corruption? Ironically, the classic example of this expanding world game is what happened to sport's world game, soccer, and the expanding corruption of its major governing body, the Federation of International Football Associations (FIFA).³³ The corruption in that organisation had been known about for decades, but it was not until Qatar was given the 2022 World Cup that finally investigative action was taken by the US whose bid was rejected. Until then organisation after organisation went along with the corruption as part of the price of doing business, just as professional cyclists and presumably many of their sponsors, went along with illegal use of performance-enhancing drugs in the 1990s.

How should governments, organisations and individuals respond to this global game? Do they play along because they can see no other choice? Do they capture evidence of corruption and bring about change? Do they attack or protect whistle-blowers? Do they enter into the spirit of the game and keep misleading records? Do they go even further and keep no records out of fear of keeping a smoking gun? A host of variations can be played on this questioning, but one game too few people seem to be playing is to capture evidence and form archives that can inscribe the corruption in civil memory.

How many organisations keep dishonest records or practise the culture of deniability? This question might seem remote from informatics

33 On 27 May 2015 the US government charged 14 people, including nine former or current FIFA officials, with corrupt practices and this was widely reported in world news outlets during that week.

professionalism, but it is precisely such authoritative information resource management underpinnings that make us compare informatics with medicine and the law. Unless there is a broad social reason for its existence, is a professional base really worth establishing? The most fundamental professional question in informatics is how can it oppose the barbarians and the new Barbary Coast and support the interests of sustainable organisations wishing to operate within healthy societies.

1.8 Nanosecond Archiving and the Governance of Data and Information

Organisations today, as we indicated above and will demonstrate in Chapter 5, have been losing control of their own records as a result of increased reliance upon electronic memory storage and the expansion of legitimate access regimes, the ubiquity of leaking by brave whistle-blowers and the activities of hackers. Again, questions abound but answers are scarce. How should our approaches to information governance be responding? How strong should legislation be requiring the maintenance of accurate records and legitimating or restricting multiple points of access? No matter how many such questions are raised, however, one conceptual question sits underneath them that need to be answered quickly. Can digital recordkeeping technically and ethically get on top of the many challenges of nanosecond archiving processes?

This is not a question that is dealing with a future that has yet to arrive. Nanosecond archiving is with us now and is raising many complex problems, as anyone who has accidentally hit the send button and cast words they regret out into cyberspace can appreciate. This archival reality can be seen in the practical consequences of the clash of values between the privacy-based right to be forgotten and the systems design need for unique remembrance that will be discussed in Chapters 5 and 6. It is there in cyberwars, hacking, leaking and the perceived need to establish security firewalls that are failing organisations over and over again. It is there in the way law enforcement agencies are scrambling to lift their ability to use cyber sources to fight expanding global and local crime and corruption.

Nanosecond archiving is bringing with it an expansion in problems related to the storage of recorded information, but the real-world organisational responses have mainly been technocratic or managerial, not professional in the informatics sense outlined above. Technocrats expand our firewalls, discuss data governance, and throw another storage server on their chains of

them. Top-down managers and politicians discuss information governance and try to re-establish some form of organisational control over information production using copyright, privacy, or other forms of regulation, and by pursuing draconian penalties for leaking. Such allocative approaches to governance (that is, a focus on production and shielding the product) require consideration, but is it a starting point when managing information or designing systems and applications? The recordkeeping single mind, on the other hand, is not focused upon production or the power of modern retrieval technologies to sweep across swathes of information. It is concerned with the organisation as a bundle of activities in the first place and when it views big data it will be from whether it contains the good oil or sludge.

We will be surprised if many of the readers of this book think that authoritative information resource management is not showing signs of neglect. Key governance issues such as transparency, accountability and the need to capture adequate and inspectable records of our transactions as ways of combating the human capacity for incompetence, crime and corruption are often being left out of the conversation. It is not, however, just a matter of getting into the modern conversation on governance. We need to bring practices to the table and leave our piety at the door. Those practices need to integrate agents, their actions and the record of those actions within a nanosecond approach to archiving the cascade of inscriptions that is a hallmark of modern information ecology.

The practices, however, will never emerge if modern discussions on nanosecond archiving and governance are, like metadata, a Tower of Babel. The fragmented adhocracies that make up information management and information systems design fight for attention from managers, politicians and technocrats and, while that remains the case, our meta-prescriptions will only add to the babble. Chris Hurley, writing for the Australian Society of Archivists discussion group, noted both the babble and the universality of recordkeeping across it in the following fashion:

Stimulating article from the IIM [imaging and information management] Linkedin Group comparing and contrasting data governance and information governance. Good luck trying to get precision into the use of this or any other such distinction in this area. It is, however, interesting to see how much of the territory covered by both terms (in this person's exposition anyway) encompasses what we might regard as recordkeeping turf. The thesis seems to be that data

governance is about ‘storage and movement’ and can, by implication, be left to the techos whereas information governance is about content management (use, retention, and destruction). Those interested in ‘information’, he seems to be saying, don’t need to worry about storage and movement.³⁴

Hurley went on to argue that, when it comes to the management of evidence, it is impossible to see how a recordkeeper could be indifferent to data governance issues such as security, lineage, synchronisation, single point of reference, preventing data loss, and masking sensitive data. Pessimistically he doubts ‘that there will be any more disciplined use of these terms in future than there has been in the past, but if these kinds of ideas are forming behind the terminology it is a conversation we need to be part of.’

We want to see recordkeeping informatics doing more than joining in on a confused and confusing conversation that so far has not even managed to look at both data and information processing in a coherent informatics-based fashion. A recordkeeping informatics approach can help bring some discipline to the conversation without stamping out individuality. All future informatics professionals including image managers can bring their perspectives on governance to bear on the bundling of activities within communication and language structures and internet-based business applications.

We are not arguing that the sky is falling down. Authoritative information resource management and its connection to nanosecond archiving are not being universally ignored. Some industries have no choice in the matter. Banking systems would collapse if internet-enabled transactions were not instantly added to the bank’s archive. A less routinised example of the need for nanosecond archiving and the problems that need to be addressed within it is provided by medical recordkeeping. One can anticipate many major advances in recordkeeping informatics to come from this area of records practice. For example, emerging plug-and-play approaches link diagnostic apparatuses directly to a patient’s medical record and provide a model for archive formation using tailorable and modular applications. Technically the approach is logical and in theory can enable attention to be paid to the backward and forward compatibility of data as new equipment is plugged into the patient’s record system and old equipment is unplugged.

Even medical recordkeeping informatics, however, is not yet following the sort of informatics approach being outlined in this book. The applications do

34 Chris Hurley, post 1529 to the Australian Society of Archivists list (archives-and-records-Australia@googlegroups.com) on 2 June 2015.

not necessarily draw upon adequate studies of organisational cultures, business analyses, examination of complex co-creation-based access and records ownership issues over spacetime, or the application of recordkeeping metadata within fully fledged continuum strategies for spacetime management. Again big-data processing techniques, while useful, are not magic bullets. Doctors are finding themselves faced with the modern digital recordkeeping problem; cascading inscriptions give them too much information and not enough readily identifiable evidence. As the data builds up they have the benefit of better searching tools but have to spend more time developing a diagnosis, even in what might seem to be a reasonably straightforward case. Apart from their own professional obligation to the patient, in litigious societies if there is a remote piece of data on a file that can affect treatment or care then the doctor or a hospital is at risk of a law suit if it is overlooked. Yet they have to rapidly make decisions that often are life and death ones.

Over time medical recordkeeping is likely to be one of the first areas of professional practice to begin to adequately cope with the expanding continuum of recorded information. It should be a source of ideas and fractals for the patterning and bundling of records, but it is not there yet. Evolution takes time, but for those in the workplace, likely to be poised over an operating table in the foreseeable future or involved in the design of internet-based business applications for cascading documentation, many immediate suggestions are made in this book, a promise that we hope to review after the book has been published. Our more immediate approach is examining nanosecond archiving. It is already happening but it needs to be done more adequately. Making instant decisions affecting the lifespan and management of recorded information about our actions is not perfectible, but within internet-based business applications we can start to address more coherently one of the greatest of business challenges for this century, how to re-establish organisations as bundles of activities.

1.9 A New Beginning for the Recordkeeping Single Mind

There is no great mystery any longer about why the mind has gone missing. The motifs seem to explain it all. There has been a failure to focus on cascading documentation within systems development, an over-focus on the single referent, and a concentration upon information and data processes ahead of business processes. The stunning productive powers of changes to information and communication technologies have taken attention away

from the need for authoritative resource management. We are, however, optimistic that the mind will return in some form and that the absence will be filled in ways that can:

- provide a model for healing the fractured nature of information management and information systems development;
- address many of the inadequacies in what used to be recordkeeping's home turf and the paper era's strong point, that of aggregating recorded information as it cascades within business processes;
- help provide a healthy overview of the transcendent whole of information management and information systems development while coming to terms with the expanding complexity of business processes at the level of the parts;
- find a comfortable home in agile computing which from a recordkeeping informatics viewpoint provides a much more hospitable ecology for modular and tailorable internet business based business applications than the data and information processing ecologies that are lingering on from last century; and
- revitalise the relationships between recordkeeping and spacetime management, mutual associations and the life-chances of individuals and organisations.

If we are right in our diagnosis of the connections between recordkeeping and many of the administrative bumbles and major global disruptions and problems that are a feature of modernity the problems and the incompetence will continue to expand unless we rediscover the recordkeeping mind.

Our diagnosis should be a cause of pessimism, not optimism, given that the recordkeeping mind is too readily identified with the paper era and has yet to take regular shape in this century. Books like this are a sign that the problem is being identified, and that actions are there waiting to be developed within our business applications. Restoring the waning strength of authoritative resource management will be achievable by establishing a suitable Actor–Network Theory for the task, including developing new forms of informatics-based professionalism and creating more authoritative internet-based business applications using the principles and practices outlined in this book. We need more people who know the difference

between a topology and a topography, appreciate which authoritative issues are best addressed by the recordkeeping single mind and can work to the larger patterns of the whole while coming to terms with the mobile and expanding complexity of the parts. They do not exist yet, but they are skills and perceptions that can be taught, and we hope this book contributes to such teaching as well as to training programs in the workplace and to the research and development of authoritative internet-based business applications.

Chapter 2

A HISTORY OF THE RECORDKEEPING SINGLE MIND, 1915–2015

2.1 Recordkeeping and Some Landmarks of Change

This is a short history of a well documented but widely misrepresented phenomenon, the Australian records continuum tradition, or more particularly a component of it, the recordkeeping single mind. The tradition has been explained in a recent consolidation by Sue McKemmish, which provides references for those who wish to follow up in detail,¹ whereas this version has a narrower purpose, which is to support the logic of the radical views presented in this book. They come from within a particular understanding of the discursive practices (the conversations) and the non-discursive practices (the things we do) that have pushed archives and records management in different directions over the last hundred years.² We could have called it a short kinetic history precisely because it will deal with the movement of practices into different spaces and times and will do so in extremely condensed fashion.

The Australian records continuum tradition is a direct result of the work of two archivists at the Commonwealth Archives Office in the 1950s and 1960s, Ian Maclean and Peter Scott. Maclean helped keep alive recordkeeping approaches to the bundling of communications within series of records while action was occurring and Scott used that series approach

1 Sue McKemmish, 'Recordkeeping in the Continuum: An Australian Tradition', in Anne Gilliland, Sue McKemmish and Andrew Lau (eds), *Research in The Archival Multiverse* (Clayton, Vic.: Monash University Publishing, 2016).

2 We use the terms discursive practices and non-discursive practices in this chapter in the hope of counteracting the view that theory is not a practical pursuit and to highlight the point in this book that what we do can often be impractical.

to construct an archival system that could be applied at any point in the lifespan of many very different forms of recorded information. As we will demonstrate in this chapter, they were developing a monistic approach to archives and records management that emerged as a strong force in the US in the 1930s. They helped create people in Australia who could work as records managers or archivists, despite being part of a workforce that increasingly followed the post 1930s American approach of dividing up the positions, associating records management with organisational records and archives with old stuff.

It is tempting to call this tradition a platypus, an Australian species of mammal that, to those who saw the first specimen taken to Europe, seemed to be a stitched-up version of many other animals. It threw out the natural history classification systems, as we believe the Australian records continuum tradition has done. Alternatively it could be called an echidna, the only other species of monotreme known to exist, which looks a bit like a hedgehog but is not. Similarly, the continuum approach is sometimes seen as a variant of a lifecycle approach. In practice it might at times look similar but conceptually it is a different animal. It specifically addresses the whole/part relationships between the simple whole and the greater complexity of the parts discussed in the previous chapter. To do so it has to take a lifespan approach, as the complexity of the parts dictates rather than imposes the rigidity of less flexible lifecycle constructs. There will be patterns (fractals in more advanced forms of mathematical continuum theory), just as there were in the paper era with its series of this and that. We do not, however, want to engage in debate with lifecyclists. It has been a red herring throughout the history of the continuum tradition and can only get in the way of thinking about the relevance or otherwise of the monistic approach on which this book on nanosecond archiving is based.

Some of the innovative elements of a monistic approach are represented in Table 2.1, *Recordkeeping Informatics as Innovation* and this short history is directed in large part at helping to explain why the points made in it have emerged from our discussions. A monistic continuum approach caters for both convergence and divergence across the full spectrum of information based specialisations without diminishing particular aspects such as the emphasis in recordkeeping on the bundling of communications. The argument which can be used in organisations is that if you separate information systems design and information management too sharply and ignore the recordkeeping challenges of bundling communications within

an expanding continuum of recorded information then you will not be able to adequately bring together for business purposes the wonders of modern information and communication technologies.

The time frame and nature of our short history will open up many differences of opinion that we believe are well worth discussing even if lifecycle theorising is of no great interest to us when it comes to charting a course for the future of recordkeeping informatics. The one hundred year time frame of this chapter provides a useful device for viewing the operation of the kinetics of the records continuum tradition as it moves out from England and the USA to Australia and enables questions to be posed about its future as it moves into global discourse. Inevitably our history will be skewed and will step on cherished beliefs at times, none more so than when it discusses registries, those phenomena that dominated public control for all manner of activities from births, deaths, marriages and land-titles to hospital administration but where from country to country there were major differences in relation to general government administrative processes. The general administrative correspondence registries, where they existed, were part of the chain of communications of an organisation and were central to the control of business actions and the formation of bundles of records during them.

We will begin in 1915 because by then the US at federal government levels had formally made the decision to ignore correspondence registry systems. It was a pragmatic decision supporting the development of the US's modern post-action business records management approaches. It is a difference that was going to reverberate within the bundling of communications and the separation of information management and information systems design and development throughout the twentieth century. Given the dominance of the US in the emergence of computing software the difference, we contend, helps explain some of the deficiencies of modern information and communication technologies when it comes to their use within business-acceptable communications. From this starting point, an absence in US practices, the chapter will discuss Australian adaptations in which there was no such absence, and the emergence of a new evolving species of archivist with American and British parentage. The chapter then canvasses the impact of the emergence of the information age in the US and Australia, first as postmodernity (the future sweeping in) then as modernity (the future as present). It will finally focus on the possible drivers of record-keeping informatics in today's new postmodern condition, networking.

We hope this chapter is long enough for trends to be obvious, short enough to allow for scrutiny and discussion of the major building blocks of

our account, and provocative enough to inspire others to write their own short histories. We need many more such histories. Ours is dominated by presences, absences and gaps. It is written from an Australian perspective and so puts a peculiar slant on English and North American practices. It ignores the history of practices in other countries. The main presence is to use history to open up a conversation on the evolution of recordkeeping informatics, a disciplinary base that will be debated by some North American and English life-cyclists but will be accepted as an obvious reality in many quarters of discussion and opens up innovative thinking of the type represented in Table 2.1. It has an organisational focus whereas many of the most interesting recent archival developments relate to participatory democracy and community archiving processes. Accordingly we hope that people with expertise in other areas will find this chapter helpful when trying to reimagine their own histories while also, via a few landmarks in the evolution of the recordkeeping single mind over the last hundred years, understand the possibilities in their own future a little better.

2.2 Recordkeeping in the Scientific Age

1915 was a high-water mark in the age of science or, as it is sometimes called, the industrial age. Industrial inventiveness drove technical change, spurred on by a World War. Science was the most powerful of cognitive forces, and societies revered thinkers about the physical, natural, social and historical sciences. They were building on the ideas of major figures from the age of rationalism, such as Charles Darwin, Karl Marx and Immanuel Kant. Scientific thought had not yet begun to fragment into many shards and the topic of spacetime was at the centre of much thinking. In 1915 one of the most popular of scientific celebrities, Albert Einstein, for example, was adding depth and breadth to his theories of relativity, while the major architect of an Australian continuum tradition, Samuel Alexander, was about to give the Gifford Lectures at Glasgow University on *Space, Time and Deity*.³

Anglo-American archival practices (discursive and non-discursive) were also beginning to emerge in distinctive forms. Anglophonic perspectives dominate this chapter because the recordkeeping single mind first emerged out of a mixture of influences from the British Public Record Office and

3 Frank Upward, 'The Archival Multiverse and Eddies in the Spacetime Continuum', in Anne Gilliland, Sue McKemmish and Andrew Lau (eds), *Research in The Archival Multiverse* (Clayton, Vic.: Monash University Publishing, 2016).

Table 2.1 Recordkeeping Informatics as Innovation

Feature	Reference
Fracture between information management and information systems design (IM and ISD) and internal fragmented adhocracies within both.	Fragmented adhocracies, ISD: Rudy Hirschheim, Heinz Klein and Kalle Lyytinen. 'Exploring the Intellectual Structures of Information Systems Development: A Social Action Theoretic Analysis', <i>Accounting, Management and Information Technology</i> 6.1/2 (1996): 1–64. IM and ISD fracture: this book.
Bundling of activities within business communications.	Mark Aakhus, Pär Agerfalk, Kalle Lyytinen and Dov Te'eni, 'Symbolic Action Research in Information Systems: Introduction to the Special Issue', <i>MIS Quarterly</i> 38.4 (2014). Recordkeeping traditions in the paper era.
The management of cascading inscriptions.	V. November, E. Camacho-Hübner, B. Latour, 'Entering a Risky Territory: Space in the Age of Digital Navigation', <i>Environment and Planning D: Society and Space</i> 28 (2010).
Getting beyond data processing as application platform interfaces in ways that make more direct contact with authoritative forms of information resource management.	J. Evans, B. Reed, H. Linger, S. Goss, D. Holmes, J. Drobik, B. Woodyat, S. Henbest, 'Winds of Change: A Recordkeeping Informatics Approach to Information Management Needs in Data-driven Research Environments', <i>Records Management Journal</i> 24.3 (2014): 205–223.
Conscious design of archivally approvable internet-based business applications.	This book.

Problem tackled in this book	Innovation in this book
The need for convergence without destroying specialisations.	Reconceptualisation of whole/part relationships within business processes using the traditional recordkeeping construct of organisations as bundles of activity.
The need to find new discursive and non-discursive practices for recordkeeping functionality. [Discursive practices are our conversations whereas non-discursive ones are the things we do.]	Reinventing recordkeeping as recordkeeping informatics.
The hollowness in modern information and communication technology indicated by the failure after more than thirty years to develop robust business-acceptable forms of email as demonstrated by the Sony Email hacking scandal.*	Directing recordkeeping functionality at cascading referents within a structured approach involving three facets of analysis (information cultures, business processes and access) and two building blocks (continuum thinking and recordkeeping metadata).
The way data processing places sometimes distracting interfaces between the agents, the business activities and the direct recording of information.	Ensuring that when necessary ISD projects consider three crucial elements of authoritative information resource management: spacetime management, mutual associations, and life-chance issues.
The failure to harness modern information communication technologies within the basic recordkeeping notion of organisations as bundles of activity.	Pointing agile computing at nanosecond archiving.

* In November 2014 a group of hackers leaked emails from Sony Pictures Entertainment and installed malware. In terms of basic causation there was general agreement that Sony's cyber-security had failed. Their subsequent legal action attempting to suppress dissemination of personal information about major clients in the emails was also largely ineffective. The US government blamed the North Korean government for the hacking and whether this was the case was debated at the time. Along the way an ongoing cyberwar between the US and China was exposed showing the close connection between daily administrative actions and larger spacetime management issues.

the National Archives and Records Administration (NARA) in the US. There was a confidence to the tone of discussions about the role of archives in both countries. In England Hilary Jenkinson, who was to become a significant figure for fifty years, as a relative novice was already self-confident enough to tell a parliamentary enquiry that the English had little to learn from continental archival traditions.⁴ Jenkinson fully understood the role of the correspondence registry in managing the flow of work and the processes that produced an authoritative record of action. Jenkinson had even worked on the registry-based records of the Hudson Bay Company.⁵ In British approaches the bundling of business activities during communication processes was still at the apex of information management and information systems design.⁶ The registrar was still king, running correspondence registries and overseeing recordkeeping processes outside of the registry. It was a Germanic approach with English twists to which the label 'Weberian bureaucracy' is easily applied. Registration was very much the accepted way of controlling things in action within communication chains. It had played a major civilising role in relation to people (e.g. a registry of births, deaths and marriages), property (e.g. land registries) and during the late eighteenth and nineteenth century it was an increasingly effective part of business correspondence management enabling colonial expansion and major bureaucratic advances in areas such as health and hospitals, social services, education and public amenities. The chief administrator in many organisations was the registrar because recordkeeping processes gave them control and the title lives on in Australia and many other countries within universities and hospitals.

In 1921 Jenkinson produced the first edition of his *Manual of Archival Administration*, which in its 1937 edition was a constant presence in Australian archival practices at least until the 1970s. The manual was rational and scientific. Within the Australian continuum tradition it was particularly admired for its spirited moral defence of archives. Only archives that were

4 He used only Belgian practices to support his argument and in the process of making his argument demonstrated that he knew little about European practices. This is discussed in Andrew Horder's MA minor thesis, 'The Context of Jenkinson's Manual', Faculty of Computing and Information Technology, Monash University, April 1998.

5 Deidre Simmons, *Keepers of the Record: The History of the Hudson's Bay Company Archives* (Montreal: McGill-Queen's University Press, 2007).

6 Within administrative correspondence registry systems, pre-action recordkeeping control is exercised and files are built up like coral during business processes. They provided an ideal systems-based paradigm for the linguistically based bundling of records of activity during communication chains in ways that respected the formation of an archive.

kept within a continuous chain of custody could be trusted to be accurate and reliable and, as late as the 1990s, Australian archivists were still pursuing moral defence within records management standards. His rules of archival description were directed at studying archives as they formed, not as end products. In a nutshell, he was a recordkeeper looking at the production process ahead of – but not at the cost of – the physical preservation of the object. His cardinal principle still survives in the management of forensic evidence in legal systems in which there needs to be a provable and manageable chain of control in the guardianship of the record.

The US might not have had general administrative correspondence registry systems, but they were yet to break from concepts based on the need to defend archival formation processes as part of the business processes themselves, even if they had few strong mechanisms other than policy-based ones for making such connections in the first place. When in the 1930s the US established a national archives and records authority [NARA], it covered both custodial archival services and advice on records services for organisations. In essence they established a holistic approach, although following the metaphors of their time it was always likely to be labeled a lifecycle approach. In fact it did not make sharp linear distinctions between records and archives management and set up a base for careful studies of what was actually happening in recordkeeping within the complexity of practice.⁷ It undoubtedly in the 1930s seemed natural to combine archival administration and records management functions, providing a prototype for what in Australia some decades later came to be known as a records continuum approach, one which linked archives and records across their lifespan. Ernest Posner noticed this new strand of clinical archival thinking in 1940 when he wrote:

If all the public records of a nation are one sole undivided fonds, the agencies that are destined to receive and keep them ultimately will be justified in claiming the right to give their advice as to how the files of government offices should be organized and kept from the beginning so as to insure a satisfactory original arrangement that will also be suitable for retention by the archives agencies. We may assume that gradually the archivists will become the nation's experts who must be consulted in all questions of public record making and record keeping

⁷ The writings of Margaret Cross Norton and Phillip Brooks provide clear and readily available examples of this.

and likewise become the trustees who will safeguard the written monuments of the past, of the present day, and of the future.⁸

Posner's idea is also European, turning the record of a nation into a monistic whole as a resource, a national fonds within which the individual office provided a physical record group, or *archieff* to use the Dutch term.⁹ The whole needs to be managed using recordkeeping techniques suited to the complexity of the tasks, an approach in tune with scientific spacetime thinking at the time. The essence of archival science in this age was that you studied archives as they formed, whether you were following the forensic logic of Jenkinson or the clinical logic of NARA.

There were, however, looming threats to the clinical approach of US archivists, especially that of the technical divide between records management and archival administration, which was growing wider. Finally, in the 1950s NARA acknowledged the split between archives and records management and accepted a simplistic notion of the lifecycle within which, in terms of institutional arrangements, records managers looked after records on behalf of the organisation, archival services dealt with historical records, and archival appraisal techniques and control mechanisms were meant to enable a baton-changing relationship to be set up.

The non-existence of British correspondence-based workflow control at organisational level involved cost savings, as did the baton-changing relationship, but together they created two classes of janitors, those sweeping up on behalf of an organisation and those collecting on behalf of a wider audience that for a time was held at arm's length from the record. The lack of systematic connectivity between records, agents and business actions across the whole lifespan of records meant they were no longer tamper-proof, the controlled bundling of activities into files during communication process did not exist, and business workflows were task-oriented but not

8 Ernest Posner, 'Some Aspects of Archival Developments Since the French Revolution', in Maygene Daniels and Timothy Walch (eds), *A Modern Archives Reader* (Washington DC: National Archives and Records Service, 1984), 14.

9 In supporting the government focus of NARA, a translation of Muller, Feith and Fruin's manual for the arrangement of archives was produced. In it the Dutchmen's approach to the archive as an organisational record was set out clearly from its first rule which argued that an *archieff* was 'the whole of the written documents, drawings and printed matter, officially received or produced by an administrative body or one of its officials, in so far as these documents were intended to remain in the custody of that body or of that official'. In the US this approach removed any sharp demarcation disputes with libraries, which until then had been the main collectors of national archives, helping to establish a joint 'archives and manuscripts' tradition.

records-dependent. The groundwork for problems when recordkeeping disappeared behind and beyond the screen was being set, but that is a topic for later in this chapter. First, we want to focus on what happened to the US's monistic thinking of 1930s when it met a different recordkeeping tradition in Australia.

2.3 The Records Continuum and its Evolution in Australia

The Australian Records Continuum tradition did not begin its evolutionary life as a platypus except in the view of it as a stitching together of other animals. Its monistic nature, as we have portrayed it so far, was mainly born in the United States. Australians first became aware of the monistic approach to records and archives shortly after the formation of the National Archives and Records Administration, when Harold White, the Deputy Librarian of the Commonwealth National Library, visited there on a study tour. In the late 1930s Australia was also considering establishing a national archival body and White produced a report recommending taking the American approach in Australia.¹⁰ World War 2 delayed developments from that report, but some of the things that pleased White (a librarian) included the fact that NARA had been formed in ways that carefully picked out a distinctive but complementary role to the National Library. It left the collecting role in relation to non-government records outside of its scope and offered records services to government agencies, marking out its territory without interfering with other institutions especially in relation to what at the time was called manuscript material to distinguish it from government and business records.

When finally Australia did get down to developing a national archival authority in the 1950s, its first chief archivist, Ian Maclean, was working in a very different recordkeeping ecology than existed in the US. The Australian government still had a strong and flourishing administrative correspondence registry tradition, and the Commonwealth Archives Office, as it became in 1958, and the Public Service Board provided a major injection of new life by appointing registrars to government departments with the express purpose of promoting the management of records across their lifespan.

10 White's paper is reprinted in Australian Institute of Librarians, Symposium on Archives in Australia, Proceedings, Canberra, 1942, and discussed in Upward, 'Association Amongst Archivists in the 1950s', in Frank Upward and Jean Whyte (eds), *Peopling the Profession* (Melbourne: Ancora Press, 1991), 93–106.

When NARA formally moved to a lifecycle approach Ian Maclean, the chief archivist of the Commonwealth of Australia, happened to be on his own world discovery tour as an information-gathering exercise for forming the Commonwealth Archives Office. It was to be an independent unit, separate from the Commonwealth National Library, and he was busy pursuing White's strategy for establishing the archives and records services side of an archives tradition that did not step on Library toes. Accordingly it was with some sense of urgency that he must have written the following words to Dr Grover of NARA:

It seems to me that the archival profession is undergoing significant change. The so-called records managers are really the archivists of the twentieth century. It is really necessary to start to think of archivists as we have known them to date as becoming what I might call, for want of a better term, historical archivists. I say this for two reasons. In the first case, the records of the mid-twentieth century are considerably different in form, quality and quantity to the records of the nineteenth century. In the second case, many archivists have ceased to be concerned primarily with collecting the records of the past for use by the present generation and are now concerned with organising the records of the present for use in the immediate future.¹¹

One can imagine how inflammatory such an argument might seem to records managers who at the time were beginning to look at how to separate themselves from archivists as a profession. The view was not un-American, however. For example, in the *American Archivist* in 1955, Morris Radoff argued that the developing split between archives and records management was dividing up a natural unity.¹²

After the development of the registrars' scheme in Australia, Maclean wrote an article on the project for the *American Archivist*, which because of the cultural differences had little impact in that country but was crucial in deepening the tradition in Australia. The first evolutionary distinctions in the antipodean archival monotreme had emerged. They involved grafting NARA's original strategies onto a government archival tradition that still relied on registries for administrative recordkeeping processes. In terms of

11 Ian Maclean, 'Comments for Dr Grover Following Visit to the National Archives and Records Services (Based in discussions with Dr Bather)', First Report on Overseas Scholarship Programme Containing a General Description of Scholarship Activities and Comments on Archives Institutions Visited, (Canberra, 1959), Appendix 1.

12 Morris Radoff, 'What Should Bind Us Together', *American Archivist* 19 (1955): 3–9.

systems development the registrars retained contact with the workflow of organisations, either through registries or through taking a workflow-based organisation and methods approach to the establishment and maintenance of records within other systems. In terms of information management, one development goes without saying, or at least should go without saying. A continuum approach deals with all records, including those which archivists at the time would have regarded as temporary, and the Commonwealth Archives Office ran a ‘temporary storage’ service up until the 1980s, an approach which was outside the baton-changing relationship that had been set up in the US.

In the next decade a major evolutionary development in the Australian records continuum tradition took place when Peter Scott developed a registration system for archives that was as monistic as any system has ever been. It could be applied at any point in time to series of records as they moved through spacetime. It could also be applied to a series of any type of record including government, business and personal papers, as well as publications. Its monistic nature suited the paper era, but it has never been rejigged for a recordkeeping metadata approach in the digital era. In its home base from the 1980s it also became predominantly a custodial system, managing all the records in the custody of Australian Archives. It lost much of its crucial whole-of-lifespan impetus, which was needed if the documentation was to be ongoing rather than see the system suffer from the killer defect of most government custodial systems, creating an unmanageable backlog of description tasks.¹³ Some archivists in Australia, however, were less concerned with the backlog and saw the system as an assault on archival integrity, accusing Commonwealth government archivists of being more prying than crown ministers at a royal birth in Tudor England.¹⁴

The cardinal feature of Maclean and Scott’s platypus was its monism, a singular way of addressing the unity of records and archives management and of the varieties of inscriptions that at the time were finding their way into government, business and collecting archives. This monistic approach ran against the tide of both discursive and non-discursive archives and records management practices in other countries. In an age of convergence this is changing. It makes us more confident that we have not been wasting

13 Margaret Desnoyers, ‘When is a Collection Processed?’, in Maygene Daniels and Timothy Walch (eds), *A Modern Archives Reader* (Washington DC: National Archives and Records Service, 1984), 309–324.

14 Gerald Fischer, ‘Letting the Archival Dust Settle: Some Remarks on the Record Group Concept’, *Journal of the Society of Archivists* 4.8 (1973): 644.

our time writing this book with its strong echoes of the Australian records continuum tradition in its emphasis upon internet-based business applications (the new series?) and agile computing. A new registrars' project beckons for those who want to recommence the largely lost organisational art of bundling activities together within communication processes.

2.4 Records Managers, Archivists, and the Postmodern Condition

The 1950s and 1960s in Australia were a period of expansion for archivists and records managers as both business and government tried to put the chaos of the 1940s behind them within an emphasis on scientific and technological development. Both groups as well as those with skills and knowledge across them were, however, about to face long-lasting challenges from new forms of information management, from trends in information systems design and from the development and the massive changes and expansions that had been accumulating within our information technologies. Academic treatments of the collapse of science and the emergence of information as the dominant social condition for knowledge formation in this era have been undertaken by many academics, including Daniel Bell and Jean-Francois Lyotard, who labelled the phenomenon the Post-Industrial Age and the Postmodern Condition respectively.¹⁵

From an informatics perspective, Lyotard addressed the transformations which 'since the end of the nineteenth century, have altered the game rules for science, literature and the arts'.¹⁶ Like Bell, Lyotard was particularly concerned with the technical transformation that was leading to information supplanting scientific method, even within science. Lyotard, at the very beginning of his book *The Postmodern Condition*, gave an impressive list of elements of linguistic informatics contributing to postmodern knowledge formation processes, noting that

... it is fair to say that for the last forty years the 'leading' sciences and technologies have had to do with language: phonology and theories of linguistics, problems of communication and cybernetics, modern

15 Daniel Bell, *The Coming of Post-Industrial Society* (New York: Harper Colophon Books, 1974) and Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge*, trans. by G. Bennington and B. Massumi (Manchester: Manchester University Press, 1984) (first published in French in 1979).

16 Lyotard, *The Postmodern Condition*, xxiii.

theories of algebra and informatics, computers and their languages, problems of translation and the search for areas of compatibility among computer languages, problems of information storage and data banks, telematics and the perfection of intelligent terminals paradoxology. The facts speak for themselves and the list is not exhaustive.¹⁷

For archivists, the facts are still speaking for themselves as they try to negotiate the practical language-based technical changes occurring within the way archives have been formed and exploited. Recordkeeping archivists, however, so far have been unable to spread their recordkeeping messages on the bundling of activities within these increasingly electronic communication processes, contributing to a degree of authoritative information resource management hollowness within all the technical change.

The transition is behind us; the information condition is now modernity, and the new postmodernity is networking, as we will argue later in this chapter. In the 1970s archivists grappling with the information age as a post-modern condition were, however, handicapped by their own modernity and collectively have yet to shrug off some crucial elements of that modernity that have been holding them back. Archives and records management revolved more and more around the increase in transactionality and the janitorial disposal actions needed to filter out what was to be managed on their shelves. Recordkeeping was losing contact with the task of bundling communications as part of the capture of records and the formation of archives. As both groups moved away from the moments of creation of recorded information they began to pin their hopes of survival on their janitorial approach to the tsunami of paper form that was beginning to build and cost money to store.¹⁸ One archivist in the US, John Roberts, argued, for example, that archival theory was much ado about shelving.¹⁹ Things on shelves dominated daily routines. It was the users of those things who sat at the big tables of decision-making and archivists and records managers served them. Roberts was reflecting reality and we are not arguing against managing things on shelves unless, as in this instance, it leads to ignoring theories like ours, which is that the concept of organisations as bundles of

17 Lyotard, *The Postmodern Condition*, 3–4.

18 Frank Upward, 'Institutionalising the Archival Document: Some Theoretical Perspectives on Terry Eastwood's Challenge', in Sue McKemmish and Frank Upward, *Archival Documents: Providing Accountability through Recordkeeping* (Melbourne: Ancora Press, 1993): 41–54.

19 John W. Roberts, 'Archival Theory: Much Ado About Shelving', *American Archivist* 50 (1987): 66–74.

activities within communication processes was suffering from neglect. We acknowledge that the keeping of records on shelves was flourishing, but archival theory had become hollow, at least in Robert's real-world view. It was a hollowing out that in the 1950s writers like Radoff and Maclean (previously referenced) warned would occur if records managers and archivists developed a baton-changing relationship built around appraisal processes rather than upon the recordkeeping based records–agents–business process relationships of the recordkeeping traditions in the paper era.

The hollowness was not easy to identify in the paper era when record-keeping was an often unconscious process integrated with actions, agents and the formation of an archive. It had offered intuitive and crucial support to scientific method and the building and use of evidence, but the intuition was beginning to disappear into computer boxes. It did not help that in post-industrial societies new forms of administration based more on more on the new linguistics began to colonise information-based goal-setting and macro-management techniques. Weberian styles of administration were being left behind for a reason. They were seen as imposing red tape upon our actions and slowing down our adoption of new information and communication technologies. In the US, for example, a *Paperwork Reduction Act* was passed in 1980²⁰ and the emphasis shifted from governance by evidence-based approaches to the use of allocative information resource management techniques (IRM) without any great awareness of recordkeeping techniques for authoritative IRM, in our view a classic case of throwing the baby out with the bathwater.

Within the clear Anglophonic bias of this short history of the records continuum tradition in motion, a very small but vociferous group of post-custodial archivists emerged in the 1990s in the US, Canada and Australia. They were united by the search for new strategies, tactics and structures for surviving the postmodern condition. *Postcustodial* was a useful label, particularly in Australia where the notions of continuous custody were adopted by the neo-Jenkinsonians in that country and translated into electronic recordkeeping information ecologies. The continuity was being disrupted by new conditions. Information management had become resolutely end-product oriented and information systems design had not begun to negotiate the difficulties involved in the bundling of activities within electronic communication processes, but some archivists were beginning to think about the problems these deficiencies raised.

20 'Paperwork Reduction Act', *Wikipedia*, http://en.wikipedia.org/wiki/Paperwork_Reduction_Act (accessed 5 October 2016).

In the early to mid 1990s, many Canadian and American archivists naturally opposed to janitorial recordkeeping approaches were invited to address conferences and seminars in Australia. They included British-Canadian archivist Hugh Taylor who wrote about archivists as information ecologists and gave the world the term ‘historical shunt’ to describe the archivists who looked after records in custody but were out of contact with the formation of archives.²¹ Another Canadian, Terry Cook, was a regular visitor, attacking a range of issues that demanded some mental effort from archivists and calling for the emergence of electronic minds to deal with electronic records.²² Yet another academic from Canada, Luciana Duranti, offered a puzzling position in which an archival limit provided a record frozen off from change to be guarded within archival institutions while arguing that records managers were the real archivists.²³

A Canadian practitioner, John McDonald, summed up the postmodern condition for many of us when he described archival formation processes as a wild frontier, noting that:

In many ways the modern office environment is not unlike the wild frontier of the last century. Instead of horses and wagons, our organizations have provided us with computers and software, telling us to charge off into the great unexplored plains of cyberspace where supposedly we can work more effectively. With a few mouse-clicks, we can easily send e-mail messages to people at all levels of the organization. We make no distinction between the substantive message and the informal ‘let’s do lunch’ type – they all go through the same electronic channel. We use our own sometimes unorthodox approaches to describe and classify our documents. And when our directories are too full, we simply get rid of the old stuff that we do not need anymore. If we could just remember what that old stuff was.²⁴

21 Hugh Taylor, ‘Information Ecology and the Archives of the 1980s’, *Archivaria* 18 (1984): 25–37, and ‘My Very Act and Deed’, *American Archivist* 51 (1988): 456–469.

22 Terry Cook, ‘Electronic Records, Paper Minds’, *Archives and Manuscripts* 22.2 (1994): 300–329.

23 Luciana Duranti, ‘Archives as Place’, *Archives and Manuscripts* 24.2 (1996): 242–255, and ‘The Odyssey of Records Managers’, *Records Management Quarterly* 23.3 (1989): 3–6 and 23.4 (1989): 8–11.

24 John McDonald, ‘Managing Records in the Modern Office: Taming the Wild Frontier’ *Archivaria* 39 (1995): 70–79.

McDonald advocated ‘behind the screen’ recordkeeping for what we are calling here the bundling of communications during the course of our activities and noted that, as an employee, he would forego some of his freedom for a bit more order. Since then cloud computing has pushed the wild frontier out beyond the computer, but so far that has only served more than ever to show up the hollow within modern archiving processes.

Visitors from the United States who did the Australian tour in the 1990s included Margaret Hedstrom, David Bearman and Richard Cox. Hedstrom argued that archivists were not alone on the wild frontier and recommended forming partnerships with other information professions who shared our concern about the quality of recorded information and archival formation.²⁵ Cox had set up the extremely influential (in Australia) Pittsburgh research project, which explored partnerships and the voices of others to frame recordkeeping requirements and systems design techniques, particularly recordkeeping metadata, to produce outcomes.²⁶ Bearman, a principal researcher in the Pittsburgh project, was widely welcomed and accepted in Australia as the leader of postcustodial thinking, having already in 1988 effectively applied his systems thinking to the pragmatics of archival methods and the vast chasm in the US between statements of archival purpose and practical outcomes.

These were powerful critiques of relevance to nanosecond archiving, but meanwhile the digital revolution pushed on, changing the face of archiving forever, but without any significant absorption of such ideas. The nanosecond archiving techniques that underpin today’s cloud computing are sophisticated, but the social and cognitive elements of informatics are ubiquitously primitive. Networking, the disruptive new postmodern condition, is not yet modernity.

2.5 The Australian Continuum Tradition and Information Modernity

The starting point for this section is the formation of the Australian Society of Archivists in 1975, when the growing emphasis upon information as a form of cognition was still a postmodern condition. It will end in the 1990s, when it was the modernity of an information age.

25 Margaret Hedstrom, ‘Building Record-Keeping Systems: Archivists Are Not Alone on the Wild Frontier’, *Archivaria* 44 (1997): 44-71.

26 David Bearman, *Electronic Evidence: Strategies for Managing Records in Contemporary Organizations* (Pittsburgh: Archives and Museum Informatics 1994).

In 1975 Australian archives and records management arrangements by then had many similarities with the US, apart from the presence of a strong group of archivists in the Commonwealth Archives Office who inherited Maclean's interest in both records management and archival administration and Scott's interest in the lifespan management of many different forms of recorded information. All groups thought themselves to be thoroughly modern.²⁷ No matter what form of modernity they had in mind, however, the productive power of modern information and communication technologies was beginning to swamp authoritative forms of information resource management.

In both countries the changes occurred when modernity was beginning to be associated with managing the end products of the expanding continuum of recorded information. There were archivists who were part of the collecting tradition first established within libraries. Both had added government archives and records services over the top of this sub-stratum. Both had seen the emergence of a records management profession. All of them were up their necks in things to manage. The key difference between the two countries was that, in the US, registration approaches to administration were absent. In Australia they were still part of modernity and had been refashioned into a new variation of an old job, that of registrar. The British version of the European bureaucratic recordkeeping tradition had survived and recordkeeping-based bureaucracies were the federal government norm. The variation had bred many continuum archivists who in employment moved easily between historical and current recordkeeping tasks, to use Maclean's classification. They too, however, were about to have to cope with a tsunami of technical change.

One of the clearest signs of concern about the state of play within authoritative resource management was a course run at Monash University in 1991 by Sue McKemmish, Livia Iacovino and Frank Upward. The course's starting point was from yet another Canadian academic, Terry Eastwood, who had argued that archives were arsenals of law, administration and history. Eastwood was a valuable cheerleader from the sidelines, but the continuum archivists at Monash were former practitioners who were worried about the loss of things to cheer about. We shared Bearman's concern that archival methods were not up to the noble tasks Eastwood outlined. The course drew upon the expertise in electronic recordkeeping

27 The title and contents of Maygene Daniels and Timothy Walch (eds), *A Modern Archives Reader* (Washington DC: National Archives and Records Service, 1984), summed up the feeling of modernity of American archivists in the early 1980s.

of Bearman²⁸ and focused on the distracting division between archives and records and its effect upon the quality of both the records being captured and the archives being formed.²⁹

In Australia the threat to the administrative role of archives was clear enough. In the years following World War 2, civil governance was underpinned by the duty of bureaucrats to keep proper records of their actions. The Commonwealth Archives Office and the Public Service Board, for example, had developed systems to implement this ideal. Government agencies had custody of the records, not organisational ownership. Records capture and archival formations were protected by the code to keep accurate and reliable records of action in business or government in the manner of a somewhat mythical but ethically oriented English clerk. You kept accurate and reliable records because they were the basis of governance. Within postindustrial management approaches, efficient and effective administration took a subordinate position to managerial goal-setting, increased information productivity, and efficient and effective resource allocation. Transactionality was increasing exponentially and administrative registries and other forms of recordkeeping niceties were beginning to be seen as something of a handbrake on action. The order of values within administration was being up-ended by the postmodern condition of the era.

The historical recordkeeping role of custodial archival institutions was also losing status. New ways of writing history were emerging that made the archives as an arsenal of evidence less dominant. Historians were not deserting the institutions, but the small trickle of researchers remained small while the use of other sources in the writing of history expanded exponentially.³⁰

Changes in the legal role of archives were more complex and are still a long way from settling down. Rules for the paper era have needed to be overhauled, which is never a quick legal process. The orders of value in the evidential role of archives could hardly be as fully subverted as they could in relation to administration and history. Evidence, in legal forums, is evidence and cannot easily be diluted into forms more suited to management

28 David Bearman, *Archival Methods* (Archival and Museum Informatics Technical Report 1) (Pittsburgh: Archives and Museum Informatics, 1989) (republished in 1991 as Technical Report 9).

29 Many of the staff, student and guest lecturer papers were published in Sue McKemmish and Frank Upward (eds), *Archival Documents: Providing Accountability Through Recordkeeping*, (Melbourne: Ancora Press, 1993).

30 John Rickard documents this in his 'Introduction' to John Rickard and Peter Spearritt (eds), *Packaging the Past* (Melbourne: Melbourne University Press, 1991).

decision-making, but the form of its production and its quantity have been changing, as have the rules for accessing the archival record through the introduction of Freedom of Information (FOI) legislation. FOI in Australia is end-product legislation that leaves aside the issue of the integrity and authenticity of the record being accessed by treating it as a single referent rather than as part of a cascade of inscriptions; but, while its nature is old-fashioned, its impact upon the way the archive has been formed is not. It has deepened concerns about the way recordkeeping can harbour information that the creators do not wish to have disclosed and has inevitably encouraged the maintenance of a selective record.

In 1991, within the Monash subject mentioned above, we wanted to focus attention back on the legal, administrative, and historical role of archives. At the time we called cascading inscriptions archival documents, because that was the closest synonym in common use at the time. The full impact of the expansion of the continuum of recorded information in elevating the importance of managing a cascading torrent rather than single referents was only just beginning to be explored in the early 1990s. A mess was emerging and the mess has grown larger over the years, as we will demonstrate in Chapter 6 on the dissemination of recorded information about human activities. In that chapter we will discuss the jangle of privacy, open access, copyright, and other legal rules and codes operating in a world of access dominated by leaking, hacking, and single-referent dominated legislation.

As we have already discussed, one reaction to this growing crisis in authoritative information resource management was to focus on postcustodial archiving, or nanosecond archiving, which has become its dominant form. As David Bearman once said at an Australian workshop in the 1990s ‘custody is a good idea – someone should implement it’, or words to that effect. In 1994, in an article on postcustodial ideals, Steven Stuckey from Australian Archives looked forward to a time when archivists would no longer touch records. A debate emerged over the feasibility of the future role of Starship Archives, which have of course arrived, but there is a sad edge to the past debate, given that archivists have played no shaping role in that arrival, unless you describe figures like Julian Assange of WikiLeaks fame as archivists.³¹

31 The hands-off ‘starship’ approach is suggested in both Steve Stuckey, ‘Keepers of the Fame? The Custodial Role of Australian Archives – its History and its Future’, in Sue McKemmish and Michael Piggott, *The Records Continuum*, Ian Maclean and *Australian Archives First Fifty Years* (Melbourne: Ancora Press, in association with

Another reaction in Australia was to produce records management standards. Records management standards will be discussed at many points in this book in relation to compliance issues and the formation of authoritative records of business transactions. In this short history all we will try to do is to put them in their place within the moving history of the single record-keeping mind. In a perfunctory sense they came into existence as part of the quality control movement of the early 1990s, which made extensive references to the need for quality records.³² Quality records can only come from sound recordkeeping processes and six standards were produced in Australia by 1996, one of which went on to provide the basis for the international records management standard, ISO 15489. The structure and writing of the Australian master standard was controlled by continuum archivists Judith Ellis, Anne Picot, Barbara Reed, David Roberts, Steve Stuckey and Frank Upward, although along the way compromises were made with lifecycle-focused records managers who had a cyclically induced tendency to want to pick up the records after they had been created and to keep archival longevity issues at bay. Within the standards, continuum-based long-term archival issues were passed on to archival institutions by including a statement of support for archival standards, and state and national archival authorities entered into the role of standards production.

The legal, administrative and historical drivers for postcustodial practices, both discursive and non-discursive, have continued to receive attention in Australia and the tradition can be studied historically via the extensive writings of the Monash University Records Continuum Research Group. At a twenty-five year celebration of that group's contribution to the survival of the tradition in Australia, an agenda for the next twenty-five years began to be hatched, of which this book is part. As David Fricker, the Director-General of the National Archives of Australia, noted at an international conference in Brisbane in 2012, archival action has to be moved upstream,³³ and more and more archivists are realising that you either

Australian Archives, 1994), 46-47 and Glenda Acland 'The Electronic Records Strategies Task Force Report: An Australian Perspective', Society of American Archivists Meeting Washington, DC, 30 August 1995 (available on the Records Continuum Research Group website since 1998: <http://www.infotech.monash.edu.au/research/groups/rcrg/publications/giasaa.html> (accessed 5 October 2016)).

32 This provided the inspiration for records managers, particularly the Records Management Association of Australia and its representative, David Moldrich, to persuade Standards Australia that they needed a standards committee that set out what it takes to produce quality records.

33 David Fricker, 'Archives – What is Our Business Model for the Digital Age?', speech to the International Council on Archives Congress, Brisbane, 23 August 2012.

include consideration of the archival future, including access issues, within the storage aspects of our ongoing communication processes, or you have missed the boat.

While the continuum tradition is sure to have a long-term future within and beyond Australia, can the same be said of the recordkeeping component of it? Recordkeeping itself needs a thorough overhaul in terms of ethics. The ideal of the Weberian bureaucracy belongs to the past, as does Jenkinson's moral defence of archives, but spacetime management of our activities, the harmony of mutual association and the protection of individual, group and organisational life-chances all require a new ethical recordkeeping base. In the academic environment at Monash University this has begun to focus on the relationship between information management and information systems design which have lost contact with each other, and with notions of co-creatorship and the rights of all parties to a transaction to have their legitimate interests protected. How will recordkeeping survive such fundamental shifts in perspective?

2.6 Are Recordkeeping and Records Management in Their Death Throes?

As we noted in Chapter 1, in 1997 the Australian Law Reform Commission (ALRC), when reviewing the Commonwealth *Archives Act*, recommended pursuing a continuum approach. They noted that:

The management of Commonwealth records should be an integrated continuum supported by

- a legislative regime clearly defining objectives and responsibilities
- a coordinated 'single mind' approach at a policy level by the various organisations with records management responsibilities.³⁴

The ALRC acknowledged that the single mind would be applied across many different activities and processes. It is about coherence, not sameness. The Commission described the fragmentation of overall responsibility for

34 Australian Law Reform Commission, Draft Draft Recommendations Paper 4, Review of the *Archives Act 1983*, accessed contemporaneously at <http://www.austlii.edu.au/au/other/alrc/publications/draftrecs/4/ALRCDRP4.html>. The final report is strongly critical of Commonwealth Government recordkeeping; see *Australia's Federal Record: a Review of Archives Act 1983* (Australian Law Reform Commission Report 85) (Sydney: ALRC, 1998), Available at <http://www.alrc.gov.au/report-85> (accessed 3 October 2016).

current records in the Commonwealth government, pointing out that even within individual agencies there was often no single records authority. For those archivists who associated organisations with the bundling of activities, the lack of control was disturbing. It was understandable to want to free up some elements of recordkeeping red tape, but the baby was being thrown out with the bathwater. Older records were mainly the responsibility of Australian Archives, which also provided some advice about current records. There was no single piece of legislation dealing comprehensively with Commonwealth recordkeeping across the lifespan of records.

This draft recommendation was not proceeded with, but it reflected and resonated with the emerging community of recordkeeping practice, including within our national archival authority and in the Australian records management standards at the time. The recommendation was opposed by security agencies and key bureaucrats, perhaps because they associated it with an archival takeover of access to records rather than seeing it for what it was – a push for archival futures to be taken into account within digital recordkeeping at the moment inscriptions are first created.

There is no use crying over spilled milk. Starship Archives was coming ready or not and the bureaucrats and our intelligence agencies were not ready for it, a fact they were sharply reminded of on 11 September 2001 when terrorists mounted attacks in the US. Subsequent investigations showed how much the bureaucratic silo mentality in relation to their own records was out of touch with reality. Their response, to build big pools of data searchable by new technologies, was, however, the response of data-processing driven minds from the 1990s, not twenty-first century agile recordkeeping minds, but it is unlikely that archivists could have achieved much, even if the ALRC recommendation had been proceeded with. They might have a history of concerns with organisations as bundles of activities built out of communication processes, but they did not, themselves, know how to use agile computing techniques to get on top of cascading inscriptions. That requires new strategies, tactics and structures, which have still not arrived in robust organisation-wide fashion.³⁵ Cognitively and socially no-one was ready for what, technically, was about to rain down upon them from the computing clouds.

35 This is discussed at length in Frank Upward, Sue McKemmish, and Barbara Reed, 'Archivists and Changing Social and Information Spaces: A Continuum Approach to Recordkeeping and Archiving in Online Cultures', *Archivaria* 72 (2011): 197–237.

In terms of cognition, recordkeeping played a crucial evidence-based role in the industrially based age of science. The ALRC recommendations and the advice of archivists that shaped them were based on an assumption that the records single mind is the same thing as a recordkeeping one. Strictly speaking it is not. Although in Australian government circles at the time the term records management and recordkeeping were usually regarded as synonyms, and they can again be synonymous if records management broadens out from its narrow information management tasks into application development and deployment roles. A recordkeeping mind puts the process ahead of the thing; a records mind might be fixed upon the end product and, as we indicated above, can be purely janitorial. In other words, recordkeeping as a process is evidence-based and connected to knowledge formation, but records management might be swamped by information sludge and end up managing dross as if it is evidence. With so much information being produced in so many new formats and by so many new apparatuses, the old arguments about the integrity and reliability of records might seem archaic, but is that simply because there has been no collective endeavour yet by informatics professionals to tap the potential of the technology for more adequate forms of authoritative information resource management?

Just as both records management and recordkeeping have been losing ground to other information workers in the social and cognitive stakes, technically both have been waning. Part of the problem with records management has been its immunity to change other than in superficial fashions like the development of a role in relation to social media.³⁶ One can see that immunity at work in a recent US Office of Personnel Management's draft description of records management positions. It states upfront that 'although computers are used to facilitate work within this series, the use of automation does not change the primary purpose of the work'. In other words, American records managers are doomed to always manage end products because that is their history. Thus the Office begins its General Occupation Information statement as follows:

Records management work involves the collection, analysis, protection and retention of Government records. Records Management specialists ensure compliance with Federal laws and statutes and advise management of any issues in this area. They formulate policy, conduct

36 R. Kegan and L. Lahey, *Immunity to Change: How to Overcome it and Unlock Potential in Yourself and Your Organization* (Boston, Harvard Business Press, 2009).

program outreach, develop metrics and ensure that sound information governance and accountability measures are in place.³⁷

It is impossible to put a kind spin on this. Just as some archivists like to imagine they work in the arsenals of law, administration and history, it would seem some records managers who have lost sight of authoritative IRM cling to a long dead reality. They continue to see their primary purpose as collecting end products and show no awareness that the technology has created Starship Archives. They are light years away from addressing the challenges of nanosecond archiving and sadly unaware that the major compliance issues these days reside in the way the end product is formed.

What is missing from this statement is the sort of awareness in the Australian continuum tradition that there should be direct relationships between agents, records and business processes, and these relationships can be reintroduced into digital recordkeeping. The tradition is a hang-over from the age of science, but today seems to be a new paradigm, such is the hollowness in modern forms of records management. As the Australian philosopher, Howard Sankey, has argued, a crisis is needed if a challenging form of scientific thought is to take hold as a paradigm.³⁸ The recordkeeping single mind might be a much neglected way of thinking in the digital era, but this might change. Crises are emerging right across the legal, administrative and historical forms of governance that government and business archivists once used to claim as their warrant for existence.

Is records management in your time and place living up to its potential to help organisations preconceive themselves as bundles of activities within communication processes? Or has it merely been carving out a small niche within the expanding continuum of recorded information? Is it relevant across all of an organisation's business activities? Or is it busy doing nothing more than managing warehouses of physical end products, digitising paper, and managing those electronic document management and records management systems that are fleeting reminders of the times and places from years gone by when registries dominated organisational information management and information systems development?

37 U.S. Office of Personnel Management, 'Draft Position Classification Flysheet for Records Management Series, O308', draft of December 2013.

38 H. Sankey, 'Thomas Kuhn's *The Structure of Scientific Revolutions*: 50 Years on', *The Conversation*, 3 August 2012, <http://theconversation.edu.au/thomas-kuhns-the-structure-of-scientific-revolutions-50-years-on-6586> (accessed 5 October 2016).

2.7 Recordkeeping Informatics in the Networked Age

A major driver in most of the decline in the relative status of archivists and records managers from the last strong years of the paper era to the early strong years of the digital era has been the stunning increase in the productive power of the expansion of our information and communication technologies. In other words while much has been lost, much has also been gained. Information sharing as both a goal and a threat and data-processing application platform interfaces have disturbed the direct relationships between business processes, records and agents of action. Archivists and records managers have struggled to adjust to the need to move beyond single referent approaches to managing cascading inscriptions. The twentieth-century split between information management and information system design, and the fragmented adhocracies on both sides of the split have made the task of adjustment even harder. While calls for convergence have been commonplace for some years now, we have yet to develop methods and ideas for undertaking this while drawing on the strength of the many specialisations that were spawned in the last century, which might still have their part to play bundling activities on behalf of organisations.

The networking underpinning cloud computing as a technique for nanosecond archiving might seem to have swept in on us quickly, but the technologies have taken a long time to assemble themselves, just as it took a long while for the linguistic changes to form themselves into an information revolution. The networked age is being built out of the cybernetics of the last half of the twentieth century as machines have increasingly begun to function as control and communication organisms. If the information age was naturally a threat to recordkeeping, the cybernetics of the new condition, however, is an opportunity to develop the recordkeeping informatics of robust business applications. The modern ubiquity of routers, web-browser technologies and the apparatus of cyberspace open up new opportunities to return to a future of defining an organisation by its bundling of activities. That, anyway, is one of the hopes underpinning this historical overview.

Just as leviathan big-data approaches emerged out of the information age, more mobile and necessarily agile approaches are emerging out of the networking condition. It will be the job of archivists and records managers to encourage all informatics professionals to harness that agility at the desktop and beyond within innovative nanosecond archiving routines for the bundling of activities creating reinvigorated agent–action–recording

relationships. A new topography can be developed to manage the complexity of the parts while putting together a coherent whole, and that topography will combine the existing bifurcated roles of information architectures that have been biased towards managing end products and enterprise architectures which have been dominated by data-processing-based application platform interfaces. Indeed, this book is built upon that emerging confidence that internet-based business applications will be the digital era's equivalent of the series in the paper era – fractals that combine data and information tasks and can be used to address the backward and forward compatibility of both on an application-by-application basis. Informatics professionals can build tailorable and modular architectures around the old concept of organisations as bundles of activities. The approach already exists in robust form within plug-and-play technologies in hospital recordkeeping, but that is only an evolutionary teaser for what is possible if collectively professional groups put their minds to the task.

Traces of the future are everywhere. Recordkeeping informatics is constantly proving itself to be useful in managing complex tasks from investigating plane crashes to making medical diagnoses. However, the new postmodern condition will probably get worse before it gets better. For every example in which recordkeeping supports the successful bundling of cascading communications there are many more economic crashes, financial and corruption scandals, bureaucratic bumbles, disastrous foreign policy decisions like the invasion of Iraq, terrorist acts, climate change revelations, refugee deluges, or runaway viruses like Ebola or AIDS that have caught us unaware in the absence of adequate recordkeeping nets or been allowed to happen by poor recordkeeping in the first place. We will point this out often in this book, and make no apology for the repetition other than for the fact that it is necessary. It is not that we are pessimists; we are not. As people from many walks of life have pointed out across human history, people have a propensity to look away from complexity and inconvenient truths; collectively informatics professionals should make every effort to avoid this trap.

Over and above the examples we make of failings in authoritative information resource management, there is the spectre of cloud computing, raising problems that even sophisticated informatics minds will find difficult to manage unless they get beyond the single referent mindsets of many existing information professionals. As we pointed out in Chapter 1, even agents of the cascade like Telstra Australia in 2015 still seemed to think you arrived at the paperless office using products like DocuSign, reflecting

views of evidence from the paper era. The treacle-slow spread of the paperless office reflects the fact that it takes major cognitive and social change for technical changes to maximise their potential. Postmodern conditions do not instantly morph into modernity. Changing information spaces requires new strategies, tactics and structures, and this takes time and a lot of adjustment to existing approaches.

This delay factor shows up most noticeably in structures, with legal systems being the most commonly referenced example. They seem to take forever to change and, given the quicksilver nature of technical change these days, the changes have to be in the principles that underpin them. The letter-of-the-law approaches will always be a long way behind. There are shifts going on. For example, legal systems for twenty years have been reassessing the nature of evidence, moving from the single referent to assessing the processes within which the referents are formed. Beyond laws of evidence, however, there are major challenges to the traditional nature of a raft of laws where single referent issues are difficult to adjust. Copyright law, patents, the regulation of banking, privacy, access and information dissemination are all struggle to maintain contact with basic legal principles. As David Howman, head of the World Anti-Doping Agency (WADA), noted while visiting Australia (where poor recordkeeping has hindered sports drug abuse investigations just as much as it does globally), three principles are at stake: easy access to information; non-expensive processes; and timely justice. In sports drug administration none of them are being delivered.³⁹ In a world dependent upon behind- and beyond-the-screen recordkeeping, all three principles will be impossible to manage in any single referent dependent field of law enforcement unless different things begin to be done. If you are involved in drug cheating you are not going to keep smoking guns. New codes of punishment for inadequate recordkeeping and internet-based business applications for the legitimate administration of sporting supplements will be needed. There is a clear and undeniable need to focus on recordkeeping within the cascade. Bad recordkeepers might not always be drug cheats, but good recordkeepers are readily seen to be defending their integrity.

Nanosecond archiving can feed into the security industry, but it will also need new institutional structures for its governance and promotion.

39 Samantha Lane, 'Prison Would Deter Drug Cheats, Says WADA Boss', *The Age*, 15 October 2015., Available at <http://www.theage.com.au/afl/afl-news/prison-the-ultimate-deterrent-for-cheats-wada-boss-20151015-gk9p1l.html> (accessed 5 October 2016).

Technologists have taken to it like ducks to water, but that is part of the problem. Nanosecond archives are a reality but the frontier of its introduction is still wild. It is hard to keep all the ducks in a row. Our archival institutional structures and the cognitive structures, such as the bases for informatics disciplines, including recordkeeping informatics that could support new arrangements, simply do not shift quickly giving rise to the call made regularly in this book (and in many other places) to get the past off our backs and under our belts.

Fortunately our strategies can change much more quickly, but, even there, bad news can arise. Without cognitive change the speed of change can itself cause problems. By far the clearest and most dramatic example of this is the rapid change to intelligence gathering techniques in the US after the terrorist attacks of September 2001. The easiest response was to shift to big-data storage techniques and harness the power of retrieval technologies, but, as we will discuss in Chapter 5, that response has put large chunks of that data into the hands of espionage agents, hackers and leakers and regularly puts single referents on the front page of newspapers where its lack of contextuality can breed misunderstandings. Firewall and official secrets based strategies have not worked. Those inside the firewalls can download torrents of information and hackers can test and expand their skills beating the walls. More agile forms of intelligence-gathering using individually designed business applications will offer a different and more robust and business-acceptable future, but they are slow in arriving in part because archivists and records managers have lost contact with how to bundle communications together for ongoing organisational business activities.

Tactics, similarly, have to adjust. In the 1990s the postcustodial systems analyst David Bearman urged archivists to consider four tactics: systems design, implementation, policies, and standards. While the classification of the tactics was valid, doing something with them required more understanding of the networking condition than archivists (or Bearman) could have had at the time. The dominant mode of structural analysis suggested by Bearman favoured leviathan big-data projects and placed application platform interfaces between business activities, people and the record. Agile forms of computing were only beginning to emerge from the gleam in the eye of innovators at the time. Policy approaches were difficult to monitor and audit, given that recordkeeping was disappearing behind the screen and are even more difficult now that so much recordkeeping is moving beyond internet-enabled objects (IOTs). Standards were tried in Australia and the records management standards that were produced in turn spawned an

International standard that has helped keep the topology of recordkeeping alive. There is a need, however, to perpetually rewrite that logic into new topographies starting with networked business processes.

Hopefully the above comments do more than demonstrate that we are not naively doing some cheerleading for a particular professional group. We understand how difficult the task of restoring the view of organisations as bundles of activities is. We do, however, think that cognitive and social change can come with a rush that will rival the rush of technical change. For that to happen there is a need for a strong network of agents with informatics minds in tune with the task and for enough recordkeeping single minds in the mix who can point effectively to the need for more adequate and ethical forms of authoritative information resource management. Anything less will leave us all to drown in cascading inscriptions.

2.8 Conclusion

Over the last hundred years we have seen a remarkable shift in perspectives upon recordkeeping. In 1915 it was normal for organisations to see themselves as bundles of activities built around communication processes in the mould of a Weberian bureaucracy. This view was a comfortable part of scientific thinking and industrialism, whether in the form of tight registry based workflows during the transaction of business or in the looser forms of after-action American business records management methods of filing. Both methods were relatively transparent, producing authoritative information resources for planning and further business, and provided useful, although organisationally biased, evidence of past actions. In 2015 that intuitive transparency has been lost within recordkeeping behind the screen, a legacy of the information age, and is now beginning to struggle to reassert itself in the paperless offices beyond IOTs.

How will this book contribute to the next phase of this short history of the recordkeeping single mind? We would like to think it can make a number of contributions to the onset of cloud computing modernity in a networked age. It might encourage information professionals to join into informatics networks as a way of both protecting their own specialisations and contributing to the convergence of those specialisations. It can cause informatics professionals to look directly at the problems that the decline in authoritative information management have been causing and look for ethical approaches to addressing them. It can also help many archivists, records managers and others to think about just how significant an issue

nanosecond archiving has become while they were understandably looking away from complexity.

Perhaps it will encourage informatics professionals to think about the postcustodial archival agenda of the 1990s. Many of the issues are still relevant to the future of digital recordkeeping now that nanosecond archiving has arrived. Archival control cannot be implemented fifteen, twenty or thirty years downstream. For those who think everything is change and that ideas flash over us and are gone, there is logic to the views that were developed twenty years ago at the leading edge of archival thought that only now can begin to be addressed. In this chapter we have referenced ideas about:

- recordkeeping behind the screen (McDonald's writing on the taming of the wild frontier)
- recordkeeping beyond the screen (Upward's writing on structuring the records continuum)
- partnerships with other information professions (Hedstrom's work in New York)
- archivally ecological approaches to information systems (Taylor's way of avoiding the historical shunt)
- new approaches to appraisal that get beyond the futile taxonomies of value for evaluating single referents (Cook)
- getting down into auditing what records are actually being created and, within individual business applications, what records should be being created (Acland's call for archivists to be auditors, not undertakers)
- managing the fluidity of records in conjunction with point-of-time fixity, when necessary using recordkeeping requirements and metadata (recordkeeping metadata research projects commencing out of the work done by Cox and Bearman at Pittsburgh)
- capturing records but only when the record needs to be fixed for the sake of reasonable risk management-based expectations of subsequent uses (Australian records management standards).⁴⁰

40 Most bullet points are referenced in the footnotes for this chapter. Two that are not are Upward's structuring the centum articles, but they have influenced Chapters 4 and 7, and Glenda Acland's, 'Archivist – Keeper, Undertaker or Auditor?', *Archives and Manuscripts* 19.1 (1991): 91–95.

This is only a preliminary list for augmentation and amendment, but it is a strong beginning for a neo-Weberian fight-back on behalf of authoritative information resource management.

The items on the list were too avant-garde in the 1990s, but the networked age means they could come back with a rush using modern information and communication technologies that are now much more hospitable than the big-data and end-product techniques of the 1990s. In particular, the cybernetics of the networked age provide natural ways of getting back into touch with the fundamental idea that recordkeeping informatics can help fashion organisations as bundles of activities formed during communication processes. Registration processes, essential to the bundling of communications within registry systems or in managing many sub-systems to carry out a particular series of tasks in the paper era, can, for example, be reborn using archivally approvable internet-based business applications.

We would also hope that readers of this book will see the three facets of analysis and two building blocks as a whole that is deliberately designed to address the complexity of the parts. Beware of notions that the whole is greater than the sum of the parts and recognise that it is the parts that require controlling with greater authority. The recordkeeping single mind should be a significant player in relation to information cultures, business process analyses, and access to recorded information about our actions. Recordkeeping metadata should be the major vehicle for bundling communications within organisations and beyond them. Continuum thinking means paying attention to the converging whole, while not losing contact with the expanding specialisations that are needed to manage complexity.

Recordkeeping informatics can become a varied, diverse, and evolutionary construct maximising the chances of successful and ethical forms of authoritative information resource management to flourish. To do so, however, it will have to shed the Anglophonic bias of this history. All societies use the technologies of their age to apply recordkeeping to their social situation and feed into their cognition. It is elementary, but because in digital recordkeeping it is disappearing behind and beyond computer screens and we need to find new evolutionary strategies by which organisations can form bundles of activities during business-acceptable communications. In short, we hope the future of recordkeeping informatics will be global as well as compatible with the complexities of particular times and places. We are fully aware that this book could have opened up stories with deep roots in the past of every country. What we are calling recordkeeping informatics

is, in one sense, an ancient human phenomenon. Indeed European and Asian nations will have much less trouble understanding that recordkeeping informatics is a reality that can be harnessed than England or the US, where the dysfunctional split between archives and records management has become particularly entrenched and has helped take both groups out of contact with their biggest joint issue – nanosecond archiving.

Part Two

Facets of Analysis

PROMOTING RECORDKEEPING CULTURES

3.1 Understanding Our Cultures

As we explained in Chapter 1, recordkeeping informatics distinguishes three facets for analysis. The first of these is information culture, the focus of this chapter. In particular, we discuss how the issues and challenges faced in our recordkeeping environment can be approached by practitioners working at organisational level. Despite much expert advice and guidance over the years, codified in standards and guidelines, which have attempted to focus our attention on how things are done in organisations, the professional community does not appear to have been very successful in developing a nuanced and sophisticated understanding of the settings in which recordkeeping takes place – our communities, our workplaces. This means that recordkeepers have not fully appreciated the nature and complexity of the influences on the ways in which people interact with records and recordkeeping systems. Practitioners are forced repeatedly onto the backfoot, reacting to the new ways of producing and searching information resources (the allocative aspects of the resource) and losing sight of the authoritative aspects such as knowing what information is reliable, where it comes from and how it came to be as it is now.

We begin by explaining the related concepts of organisational and information culture, making reference to interpretations and influences from management fads and fashions. We see information culture as a source of more stable analyses and identify specific features that provide insight into its dimensions while introducing a framework for its analysis. From this discussion we point to factors that need to be taken into consideration to develop and promote a *recordkeeping culture within the information culture of an organisation*.

These factors have been detailed in previous publications,¹ so will only be briefly restated here. To date, research into information culture has taken place in workplace environments, but the concept is just as valid in any community setting, where there are ‘shared beliefs, values, experiences and interests and which have come to have a shared sense of identity or purpose in problem-solving’.² One cluster of these factors relates to the values, attitudes and behaviours of organisational members which impact on recordkeeping processes. Another cluster is encompassed by the technical environment, including cloud computing. Societal and organisational requirements, including the legislation and standards and related policy that contain the requirements for recordkeeping, are also included, with particular attention paid to compliance. The legislation might be in place, but how do we know that its provisions are being accepted and applied? The extent to which employees are aware of and accept the provisions of legislation and the regulatory environment is a critical factor influencing the efficacy of our organisational settings. These factors are further explained in the Information Culture Framework section below.

Our organisational settings are influenced by the past as well as the present, and will continue to evolve in the future. Australia and New Zealand share the experience of a number of English-speaking countries, but even there, we are more like some than others. We have most in common with other countries that have a colonial tradition of governance by a remote administration. While our colonial heritage is long past, it has profoundly affected our system of government, the way we do business (and therefore recordkeeping), and the way our public and private sector interact (see Chapter 2). The final section of this chapter considers national and transnational settings, including language.

3.2 A Multiplicity of Cultures

The values, attitudes and behaviours of employees or members of an organisation, broadly defined to include communities as well as workplaces, influence the shape, nature and, indeed, success of recordkeeping processes.

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- 1 In particular, Gillian Oliver and Fiorella Foscarini, *Records Management and Information Culture: Tackling the People Problem* (London: Facet, 2014).
 - 2 Tom Denison, Mauro Sarrica and Larry Stillman, ‘Introduction’, in Tom Denison, Mauro Sarrica and Larry Stillman (eds), *Theories, Practices and Examples for Community and Social Informatics* (Clayton, Vic: Monash University Publishing, 2014), xi–xvi.

To put this another way, analysis of organisational culture is essential in determining how best to approach the management of information for accountability purposes and to sustain ongoing business activities – to enable that clear focus on authoritative resource management. However, the concept of organisational culture is problematic because of multiple meanings and interpretations and its overly simplistic usage as a convenient management device. Consequently, information culture has emerged as an alternative conceptualisation, and this can be further focused specifically on recordkeeping. Each of these concepts is further discussed below.

3.2.1 Organisational Culture and Managerialism

Organisational culture has been widely acknowledged to be a powerful setting from the perspective of establishing appropriate and effective recordkeeping processes. In the context of electronic document and records management systems (EDRMS) implementations in particular, organisational culture has been depicted as being a powerful, usually negative influence with regard to user uptake of systems³. But we lack a shared understanding of what constitutes organisational culture, and this inevitably leads to misguided attempts to change and mould it as if it is something that can be adapted at will. It seems as though organisational culture is the holy grail for change managers, in the English-speaking world at least. Changing the culture, it is believed, will result in different and improved behaviours and attitudes.

The view of organisational culture that can be changed at will and related depictions of ‘good’ and ‘bad’ cultures can be attributed to the populist management theory of the 1980s. Of particular significance to recordkeepers are the ways in which an ‘excellent’ culture were described. As explained in Chapter 1, Thomas Peters and Robert Waterman popularised the idea that a characteristic of organisations could be defined, which they termed excellence, which could be directly attributed to success in the marketplace.⁴ The evidence they used in support of this proposition was anecdotal, gathered from their experience as consultants. Their writing should be of particular interest to recordkeepers for two reasons. Firstly,

3 See, for instance, L. Downing, ‘Implementing EDMS: Putting People First’, *Information Management Journal* 40.4 (2006): 44–46, 48, 50, and J. Gunnlaugsdottir, ‘As You Sow, So You Will Reap: Implementing ERMS’, *Records Management Journal* 18.1 (2008): 21–39.

4 Tom Peters and Robert Waterman, *In Search of Excellence: Lessons from America's Best-run Companies* (New York: Harper and Row, 1982),

some of the features these authors identify seem to be in conflict with the objectives and aspirations of recordkeeping processes. Documentation is clearly identified as a feature that is not present in companies with the strong cultures characteristic of excellence (highlighting again the overwhelming prioritisation of allocative resource management to the detriment of authoritative resource management). Secondly, Peters and Waterman's ideas have been enormously influential on successive generations of managers.

The popularity of this simplistic concept can be seen in the way in which this notion of being able to identify specific features that represented excellence was adapted and localised both in Britain⁵ and in New Zealand. The New Zealand version was named Theory K, with 'K' standing for 'Kiwi'.⁶ Features that would not enhance the recognition of the need to value and respect the management of information as evidence are very apparent in this New Zealand version. So, for instance, the absence of documentation in successful companies is emphasised – 'the company mission is not written down',⁷ and the behaviour of role models does not include documenting decisions or actions, for instance, 'There is almost no paperwork; Group Manufacturing Manager Bruce Walters says he has written only three memos in two years'.⁸

Ironically, but not surprisingly, many of the organisations singled out by Peters and Waterman as excellent are no longer in existence; 'So many of the excellent companies are no longer successful, or even around for that matter? Herein may perhaps lie the most valuable lesson of all to come from the excellence work: never rest on the laurels of excellence, but rather, reinvent the organisation as the game changes'.⁹ The Peters and Waterman simplistic depiction of organisational culture does not take into account the various layers of influences, as described by scholars such as Edgar Schein (who distinguishes artefacts, beliefs and values along with underlying assumptions as shapers of organisational

5 Walter Goldsmith and David Clutterbuck, *The Winning Streak* (Palo Alto: T. Peters Group, 1984).

6 Kerr Inkson, *Theory K: The Key to Excellence in New Zealand Management* (Auckland: David Bateman, 1986).

7 Inkson, *Theory K*, 55.

8 Inkson, *Theory K*, 162.

9 A. Caruana, L.F. Pitt, and M.H. Morris, 'Are There Excellent Service Firms, and Do They Perform Well?', *The Service Industries Journal* 15.3 (1995): 243–256 (p. 254–255).

culture)¹⁰ or the Dutch anthropologist Geert Hofstede.¹¹ Hofstede's theory explicitly acknowledges the broader environment in which the organisation is situated by distinguishing national, occupational and corporate cultures as layers that contribute to the overall organisational culture.

These contested and contradictory notions of organisational culture are more than just academic differences of opinion. They have very practical implications for recordkeeping within organisations, given that organisational culture has been singled out as a problematic concept with negative consequences for the implementation of organisation-wide recordkeeping systems. Furthermore, this is not just something that can be viewed as a historical phenomenon. For instance, lean management (also referred to as the Toyota way) also insists on the need for a 'change of culture'.¹² The implications for recordkeeping of this 'lean philosophy' are not clear, but we must be alert to significant potential for negative influences. In order to be impervious to the latest management fad, recordkeeping needs to be not only embedded in the bedrock of the organisation, but also adaptive and agile in terms of tools and messages.

Those managers at senior executive level now who were exposed to the English-language popular management theory of the 1980s are likely to have the very simplistic understanding of the concept of organisational culture popularised by Peters and Waterman. This is a dangerous area as there will not only be a belief that, given sufficient effort, the culture can be changed, but also there may well be conscious or unconscious associations between recordkeeping and 'weak' cultures.

There is less risk of ambiguity if the focus is on *information culture*, from which can be identified specific features relating to recordkeeping, and so lead to clear guidelines to develop a *recordkeeping culture*. Every organisation, no matter how large or small, regardless of whether it functions in the public or private sector, wherever in the world it is situated, has an information culture. Information culture can be defined as the behaviours associated with and values accorded to information, specifically within organisational contexts, regardless of organisation type (so including workplaces and other community groupings).

10 Edgar H. Schein, *Organizational Culture and Leadership*, 3rd ed. (San Francisco: Jossey-Bass, 2004).

11 Geert Hofstede, *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*, 2nd ed. (Thousand Oaks, CA: Sage, 2001).

12 S. Bhasin and P. Barcher, 'Lean Viewed as a Philosophy', *Journal of Manufacturing Technology Management* 17.1 (2006): 56–72.

As with all organisational settings, there are aspects of the information culture that will vary over time, but there will always be relationships among the different characteristics, so they should not be considered in isolation from each other.

3.2.2 Insight Into Information Cultures

The ways in which people work, the unofficial systems that individuals or groups develop in order to get their work done, provide a powerful lens to view and diagnose information culture. One of the key questions to ask relates to the workarounds that have been developed. So instead of primarily focusing on the official or so-called ‘best practice’ systems, analysis of information culture requires foregrounding the rogue and the feral systems – the frequently unwanted or even prohibited innovations that people cobble together. Workarounds might include, for instance, the use of personal messaging accounts or rather than official systems, or use of personal pen drives to store copies of work in progress. Once workarounds have been identified, the next step is to explore why these particular systems have been found to be necessary. Responding to the why question will map to one or more of the clusters of factors discussed below, which can then be linked to specific levels of the information culture framework. In other words, we propose that, rather than taking the customary default position of ignoring, attempting to bury or discounting workarounds, they can be a primary focus for cultural diagnosis.

Similarly, the use and deployment of genres and genre systems, as discussed by Fiorella Foscari, provides insight into information cultures.¹³ Genres should not simply be understood as referring to documentary forms, but encompassing all settings involving communicative transactions. By taking this holistic approach, meetings that have particular significance in terms of enabling or precluding activities will come under the spotlight. Who participates?; who is excluded? Are there records of these meetings which reflect what happened and how decisions were made? Answers to these questions will map to information culture framework features.

3.2.3 Information Culture Framework

Just as the organisational culture concept has been viewed as a series of interacting layers, influences that shape an organisation’s information culture can be categorised into three different levels, as shown in table 3.1:

13 Fiorella Foscari, ‘A Genre-based Investigation of Workplace Communities’, *Archivaria* 78 (2014): 1–24.

Table 3.1 Information Culture Framework

Level One	Fundamental values and other features that are significant influences, but difficult to change
	<p>Respect for information as evidence. Recognition and awareness of the need to manage certain information for the purposes of accountability, and readiness to comply with those requirements</p> <p>Respect for information as knowledge. Recognition and awareness of the need to manage certain information for the purpose of increasing knowledge and awareness.</p> <p>Information preferences. Including willingness to share information, as well as preferences for different sources of information and communication styles.</p> <p>Language requirements. Encompasses the consequences of language as a socially constructed phenomenon (e.g. relationships between different professional/technical languages) as well as constraints associated with particular character sets used and also the need for multilingual versions of information.</p> <p>Regional technological infrastructure. The technological infrastructure of the country or region or sector or network of which the organisation is part.</p>
Level Two	Skills, knowledge and experience related to information management, which can be acquired and/or extended in the workplace:
	<p>Information related competencies, including information and computer literacy.</p> <p>Awareness of environmental (societal and organisational) requirements relating to information.</p>
Level Three	The third and uppermost layer is reflected in:
	<p>Corporate information technology governance.</p> <p>Trust in organisational systems.</p>

This framework can be used as the basis for the definition and subsequent promotion of a *recordkeeping culture*, by focusing specifically on those settings that are relevant to the management of information for the purposes of accountability, evidence and memory. The significance of the levels identified here is their correlation with openness to change. Factors at Level One are least susceptible, whereas those at levels two and three are most susceptible to change. Subsequent discussion considers these factors from the perspectives of values, attitudes and behaviours, technological and environmental settings, with reference made to their framework level.

Traditional approaches to managing records focus on surveys of paper and digital objects. Specifically identifying records at a given point in time provides little benefit beyond perhaps demonstrating the scale of the problems that are faced. The important features that urgently need to be made explicit relate to people, their attitudes to information that requires management as evidence for accountability purposes, and their recordkeeping behaviours. Analysis of an organisation's recordkeeping culture will clarify the nature and profile of people-related risks. Successful recordkeeping initiatives will be developed from a range of customised strategies and solutions tailored to fit a specific environment. The information culture framework will help identify the key features, distinguishing those that are most susceptible to change and those that are most resistant. But by being cognisant of both extremes, practitioners will be equipped to develop appropriate strategies to implement effective recordkeeping systems and, importantly, have realistic expectations of what can be achieved with the implementation of new systems and technologies.

3.3 Values, Attitudes and Behaviours

A core value is shown at the first level of the Information Culture Framework, namely respect for recordkeeping processes, which is the extent to which it is accepted by members of the organisation that it is necessary to manage information for the purposes of accountability and to sustain ongoing business activities – in other words, to manage information as an authoritative resource. Evidence to assess this can be seen within the organisation in a number of different ways, such as in the allocation of resources to recordkeeping and in the complexity and comprehensiveness of recordkeeping infrastructure and processes. Attitudes towards recordkeeping are just as important to assess and can be done by determining whether management considers that recordkeeping should be part of everyone's roles and whether employees consider recordkeeping to be part of their responsibilities. In a voluntary community context, do members engage in recordkeeping activities? There may also be external observation of a sector or industry that can shed light on the value accorded to recordkeeping. For instance, in New Zealand, the Prime Minister's Chief Science Advisor reported on a study of the use of evidence in policy-making in the public sector. Findings suggest that very few New Zealand government departments are likely to use evidence in making policy

decisions.¹⁴ In such an environment the evidence suggests that record-keeping is unlikely to be prioritised and may even be regarded as a threat rather than an essential pillar of good governance.

It must be emphasised that this value is not particularly open to change, but it must be identified. If the organisation is one where respect accorded to information as evidence is low, this is something that needs to be taken into account in shaping strategies, solutions and actions.

Preferences for different sources of information (e.g. oral versus textual) are another significant feature that requires recognition. Preferences cannot simply be changed, but they can and must be taken into account. Preferences are likely to be manifest in behaviours – for instance, instinctively asking colleagues how to do something rather than referring to formal written procedural documents, and vice versa. Consistent preferences for written sources will indicate a high level of trust in textual information, as opposed to primary trust in one's social network. Understanding what preferences are present will help in the prioritisation and promotion of recordkeeping. So, if members of an organisation are more likely to ask colleagues or peers for guidance rather than consult formal documentation, promoting a record-keeping system on the basis that it will provide authoritative information is unlikely to be effective.

Willingness to share information, or the extent to which information-sharing is regarded as the norm within the organisation is another important characteristic to take into account. It cannot be assumed that comprehensive recordkeeping systems, if they are implemented to facilitate the retrieval of information across the organisation, will necessarily be regarded as a good thing by management and/or employees. There are two dimensions that are likely to be influential here, one related to deeply held values and the other related to the function and purpose of the organisation. This factor has become even more crucial to understand given current shifts towards cross-organisational information-sharing.

National cultural dimensions may be influential in determining attitudes of people towards sharing information. Hofstede's research indicates that if the organisation and its employees are based in a country which has a high ranking in terms of collectivism and/or power distance, it is likely that

14 Peter Gluckman, *The Role of Evidence in Policy Formation and Implementation: A Report from the Prime Minister's Chief Science Advisor* (Wellington: Office of the Prime Minister's Science Advisory Committee, 2013). Available at <http://www.pmsa.org.nz/wp-content/uploads/The-role-of-evidence-in-policy-formation-and-implementation-report.pdf> (accessed 7 October 2016).

there will be reluctance to share information within the organisation.¹⁵ If, of course, the organisation is multinational or operates internationally the perspectives of local employees may just represent one facet of opinion, and variations in practice will be evident in different regions.

The function and purpose of the organisation, the sector within which it operates, and its human resource management policies will have significant impact on the extent to which information can or should be shared with others, and on perspectives on information ownership. For instance, social services, justice or healthcare agencies are likely to have stringent procedures restricting access to client files to designated roles within their organisations. Professional codes of ethics, identification of key stakeholders (e.g. the subject of the record) and recognition of their rights, as well as relevant legislation, will mandate attitudes to sharing information in these instances.

If however an organisation's human resources policies promote competition (e.g. in a sales environment), this will influence the extent to which information will be shared with colleagues. In this case, refocusing the organisation's business strategy is unlikely to be an option, so it will be important to factor information ownership or data custodianship into system design – in other words, to include provision for individuals to protect information they view as providing competitive advantage for designated time periods within the overall system. If this information-sharing characteristic is not taken into account, recordkeeping systems are unlikely to be used. It cannot simply be assumed that information-sharing is a good thing; whether it is appropriate or not will depend on the organisation's mission and functions.

A behavioural feature is also shown at Level Three of the Information Culture Framework, namely the extent to which recordkeeping systems are trusted by individuals. No matter how robust or how well designed recordkeeping systems are, success will be undermined if people do not trust that information they contribute will be able to be retrieved as and when needed. The result will be, quite simply, hoarding of organisational information. If appropriate systems are in place, and information is being withheld and maintained in the individual's personal or team working environment with no easily recognisable barriers to use, lack of trust is a problem area in need of attention.

15 Hofstede, *Culture's Consequences*, pp. 108 and 244.

The Level Three positioning of this trust factor is important, as it signals that this is a behaviour that can be changed. The key is to be open-minded, to explore the reasons for the lack of trust and to address those reasons, collaborating with others struggling with the same issues (data governance, data warehousing professionals, internal auditors, legal counsel, etc.), thus creating internal synergies perhaps united under the umbrella of information governance rather than existing as isolated siloed initiatives. Making it mandatory that a certain process must be followed is clearly too simplistic an approach. Change in this respect is likely to be a slow and gradual process, requiring sustained ongoing effort to build interpersonal relationships and to demonstrate service effectiveness. Above all, critical reflectiveness will be required on the part of recordkeeping professionals, who need to be able to recognise and question service effectiveness and to shift their thinking to see other people's perspectives.

3.3.1 Information Related Competencies

The middle layer of the Information Culture Framework, Level Two in Table 3.1, is concerned with what people can do, especially about their skills, knowledge and experience, in relation to information. Thinking about this area in the context of developing and promoting a recordkeeping culture focuses attention on the skills, knowledge and expertise relating to recordkeeping processes. This applies to all members of the organisation and not just to those who have oversight of recordkeeping activities. This area cannot be addressed in isolation from the other two levels; it is only by sufficiently diagnosing Level One characteristics and being aware of Level Three features that this area can be targeted and addressed appropriately.

We are concerned here with how knowledgeable people are about information and its use in the digital environment, as well as with their understanding of policy requirements to behave in certain ways, such as the need to protect certain information for privacy reasons and to create records for accountability and transparency. The need for accountability and transparency is the aspect primarily targeted in traditional records management training programmes, but we argue this is only part of the puzzle. The information and digital literacy of people becomes harder to assess the more that systems designers provide increasingly user-friendly interfaces. People may appear to be confident and mature users of technology, but this can mask their very limited understanding of such things as the risks inherent in choosing a certain file format or storage device or system/app to do their

work in. This is particularly apparent in the behaviours and practices of digital natives; familiarity with social media does not necessarily correlate with a broad and deep digital literacy.

3.4 Technological Settings

At times technological settings appear to attract the most attention in our professional discourse. Disruption is a feature of the digital age that we discuss throughout this book, so here we do no more than signal technological settings as a key feature to be analysed and monitored in developing a recordkeeping culture as part of the organisation's information culture. The choices that are made are constrained by a powerful cocktail of forces, including governmental policies, software vendors and telecommunication companies. We refer to Facebook and Twitter as internet colonial powers. In the corporate setting Microsoft, Google and Amazon can similarly be regarded as global colonisers, begging the question whether their understanding of and approach to information is culturally appropriate for all environments. This wave of global colonisation and the basis on which implementation decisions are made reflect the power and predominance of the allocative approach to managing information.

3.4.1 Regional Technological Infrastructure and Organisational Policies

The capability and capacity of the organisation's internal information technology systems will, of course, have an impact on the nature of recordkeeping systems, but it is important to take a step back and consider the broader environmental context, because this dictates the opportunities and constraints that are the parameters for internal development. In addition, regional capabilities will influence the extent to which employees are restricted to working within organisational boundaries, their acceptance of organisational limitations and/or need to develop alternative solutions. It is the regional context that is noted at Level One of the Information Culture Framework, its Level One positioning signaling the difficulty of change.

Today's cloud computing environments offer a huge range of possibilities for alternative ways of working and are forcing fundamental change on the ways in which the IT function is run at organisational level. Everything is now about being outsourced and virtualised. The primary focus of IT's role in organisations is no longer on the nuts and bolts – the hardware, cables, networks and so on – but has shifted to contract management. What is of

value to the organisation is the information – that’s the good oil. Moving it to the cloud is a ‘storage’ solution, not a management issue; the data lasts longer than the systems in which it is managed.

From a recordkeeping practitioner perspective, when it is no longer necessary to be in a designated physical space in order to work, a whole range of issues arise that will make life much more complicated. People are able to log into their work systems, such as email, and conduct business from remote locations. Voice over internet protocol software, such as Skype, enables real-time global communication. Computing in the cloud means using cyberspace as a vast open-plan office and storage repository, opening up possibilities for collaborative working, alongside other issues that are increasingly apparent, such as ownership and responsibility for data. In addition, portable storage devices (and bring-your-own-device (BYOD) initiatives) enable employees to carry vast amounts of data away from work premises, thus, of course, raising huge risks in terms of loss and unauthorised access to information.

Underlying people’s ability to take advantage of these features is the need for adequate equipment, power and access to information technology. There will, of course, be huge contrasts between the facilities available in Western developed countries and those in Third World developing countries, on the other side of the digital divide. But some features of the Web 2.0 environment may enable digital working in ways not possible in countries that do not have such a robust technological infrastructure. Contrasts are also apparent among countries in the developed world, largely due to telecommunications policy and the associated infrastructure. Free wireless internet makes a huge difference to the extent to which people will take advantage of the flexibility of communication and will incorporate it into working outside the bricks and mortar of traditional organisational boundaries.

It is also important to bear in mind, of course, that, if a regional technological infrastructure facilitates the use of these new tools and features (a factor considered at Level One of the Framework), organisational policy should reflect this reality. Otherwise the result may well be sabotage of internal recordkeeping systems, whether that sabotage is deliberate or incidental. Incidental sabotage is most likely to occur when people develop their own workarounds to policy that is perceived as being a bureaucratic, meaningless barrier to efficient working.

The interplay between the regional technological infrastructure and organisational policy is frequently seen when policies are counter to the ease with

which people can create, use and manipulate information. For example, where arbitrary size limits or access restrictions are established for work email accounts, if cloud alternatives (e.g. gmail or Hotmail) are readily available, there is a strong likelihood that they will be used to facilitate working. In such situations, the organisation's most important information resources are exposed to significant risk, largely because insufficient attention has been paid to understanding how information technology is used to support work practices. One consequence of this increasingly fragmented technology space is a greater awareness among management of the organisational value of information itself as an asset, transcending the specific technology deployed, which allows an opening for the messages of record-keeping informatics approaches.

The regional technological infrastructure plays a critical role in shaping and influencing recordkeeping practices. It must be taken into account when developing policies, which involves keeping up-to-date with the latest social networking tools and finding out how they are used within organisations. It is in many ways much easier to take a draconian approach and to limit the use of such tools or ban the use of portable memory sticks, but the end result of such actions is highly unlikely to be beneficial to organisational recordkeeping. So the emphasis has to be put on understanding how and why people use technologies to support their work and on working on the basis of that understanding to develop appropriate policies that will support recordkeeping aims and objectives.

3.4.2 Cloud Computing and the Postcustodial Archivist

Cloud computing is discussed throughout this book. A common industry definition of cloud computing is that it enables information resources to be 'rapidly provisioned and released with minimal management effort or service provider interaction'.¹⁶ That definition has a reductive element to it, focusing on easy applications and then saying how easy it is. Taking recordkeeping perspectives into account, however, means that we cannot accept such simplistic definitions. What about those web applications that require a lot of analytical effort in order to set up suitable metadata structures? What about applications that involve interactive decisions based on risk during the course of our transactions? What about all the dubious privacy practices going in the 'back office' of apps? What about WikiLeaks? Are complex authoritative agile computing applications really outside of the

16 Peter Mell and Timothy Grance, *The NIST Definition of Cloud Computing* (Gaithersburg, MD: National Institute of Standards and Technology, 2011), 2.

parameters of cloud computing because a few industry insiders say it is built upon the easy application?

3.5 Legislation

Social and organisational requirements relating to recordkeeping are likely to be embedded in legislation, particularly that relating to the protection of personal information and freedom of access to information. Once again, the legislative environment certainly has the potential to be in a continual state of flux; whether or not the legislative settings most relevant for recordkeeping change in organisations will be influenced by political and social pressures. The ways in which individuals respond to those legislative settings will be culturally influenced. Legislation and its impact on recordkeeping processes are discussed throughout this book. Legislative requirements are an important feature of organisational settings, so this discussion is in the context of building a recordkeeping culture, specifically from the perspective of users' awareness of legislative requirements and attitudes towards those requirements. This is signaled at the second level of the Information Culture Framework, relating to skills, knowledge and expertise. The legislative requirements that are applicable will vary over time according to jurisdiction, organisation type and functions. For instance, different requirements may apply to organisations in public and private sectors, or to those in the retail and manufacturing industries. More fundamentally, the implementation of legislation as a compliance tool locating recordkeeping into the domain of compulsion, as opposed to legislation as a check and balance for good organisational operation, is dictated by organisational experience, but it can have a tremendous impact on how recordkeeping is carried out.

Political structures and transnational alliances will also influence the nature and type of legislative requirements for recordkeeping. For countries like Germany, Australia and the United States, which are federations of separate states, there may be legislation at both state and national level. A country's membership of an international alliance, such as the European Union, will also have legislative implications as it introduces another layer of complexity. It is not just a question of where an individual or organisation has their home base; if transactions occur across national or regional boundaries, external requirements will also have to be taken into account and reassessed over time. Furthermore, the notions of residency, nationality and even home base are becoming complex in

their own right. For example, Estonia has officially launched the concept of e-residency, so that ‘People from all over the world will now have an opportunity to get a digital identity provided by the Estonian government – in order to get secure access to world-leading digital services from wherever you might be’.¹⁷

Given the many requirements, our consideration here is focused on two generally applicable areas of legislative activity in democracies – privacy and freedom of information.

3.5.1 Privacy

Privacy requirements relate to the need to protect personal information about oneself or about other people. The extent to which privacy is protected by legislation varies from country to country. Similarly, the extent to which relevant laws or standards are recognised and adhered to by individuals also varies greatly from country to country. It is no longer sufficient to restrict consideration of privacy requirements to one’s local settings. These variations in attitude are also apparent beyond formal organisational e-commerce systems and are impacting on social networking spaces. The variety of approaches to the protection of personal information ranges from jurisdictions with no formal legislation or rules at all to those with high government involvement and control. Privacy International, a UK-based non-profit organisation, provides country profiles and international comparisons that demonstrate the diversity and complexity of approaches.¹⁸

History, politics and culture are all significant factors that influence people’s attitudes to the importance of protecting information about themselves. The divergent views on personal information privacy in Europe and the United States clearly illustrate the significant cultural differences at play in protections required. In countries where there is less awareness of the potential for personal information to be used to hold power and control, even if there is relevant legislation, it may not be regarded as important; implementation of legislation may have been in response to international pressure in return for favourable trading conditions rather than in response to internal drivers. In such an environment organisations need to provide very clear and explicit guidance and to put in place procedures that

17 Taavi Kotka, Janek Rozov, and Liivi Karpistšenko, ‘E-Residency in E-Estonia’, paper presented at the 7th Triennial Conference of the DLM Forum, 12–14 November 2014, Lisbon, Portugal, p. 3. Available at http://purl.pt/26107/1/DLM2014_PDF/30%20-%20e-Residency%20in%20e-Estonia.pdf (accessed 7 October 2016).

18 <https://www.privacyinternational.org/reports>.

determine what the requirements to protect personal information are, and there should be no expectation that employees would necessarily understand *why* those requirements were being implemented. At societal level, this is a clear area where the norms of the global colonisers such as Google and Facebook can be in conflict with the norms of the colonised.¹⁹

3.5.2 Freedom of Information

Freedom of information refers to the rules that guarantee access by citizens to the information held by governments. Once again, there are a wide range of different attitudes towards freedom of information, some of which can have the effect of not actually realising the intent of legislation. The development of FOI legislation (the *Official Information Act* 1982) and subsequent open-data initiatives in New Zealand provides another illustrative example. Calls for the need to ensure that recordkeeping systems were capable of supporting effective responses to freedom of information requests were unheeded, as was call for the establishment of an information authority.²⁰ More recently, the Open Data Futures Forum made two recommendations that echoed those made in the context of freedom of information. One called for the establishment of an independent data council; the other stated that the management of data ‘should build trust and confidence in our institutions’.²¹ Whether or not these calls will be heeded and acted upon remains to be seen.

Britain is one of the last Western democracies to implement FOI legislation. Tony Blair, who as British Prime Minister led the implementation of FOI has referred to this as one of the worst mistakes of his time in office.²² In Australia attempts to abolish the statutory office of Information Commissioner at the Commonwealth level and the effective demotion of the equivalent position in Victoria indicate immediate links between political style (ideology) and the waxing and waning of the ideas of accountable and transparent public information.

19 See, for example, Europe versus Facebook, <http://www.europe-v-facebook.org>.

20 Nicola White, *Free and Frank: Making the New Zealand Official Information Act 1982 Work Better* (Wellington: Institute of Policy Studies, School of Government, Victoria University of Wellington, 2007).

21 New Zealand Data Futures Forum, *Harnessing the Economic and Social Power of Data* (Wellington, 2014), p. 73 and 77. Available at http://apo.org.au/files/Resource/nzdff_harnessingtheeconomicandsocialpowerofdata_aug_2014.pdf (accessed 7 October 2016).

22 Ian Cobain, ‘Mixed Results Since Blair’s ‘Dangerous’ Freedom of Information Act Launched’, *The Guardian*, 21 September 2011. Available at <http://www.guardian.co.uk/politics/2011/sep/20/mixed-results-blairs-dangerous-act> (accessed 7 October 2016).

This reluctance to legislate in favour of open government has also been noted in some countries that were former British colonies. Hong Kong, for instance, still does not have any FOI legislation. A number of laws relating to information management were introduced in Hong Kong just before the territory was handed over to the People's Republic of China. Freedom of information, however, was not addressed. In fact, Britain played a key role in preventing its introduction. In Jonathon Dimbleby's account of the handover period in Hong Kong, specific mention is made of the Governor (Chris Patten) blocking attempts to introduce FOI legislation in Hong Kong.²³

A key concern for recordkeeping is whether a legislative mandate to access information has a negative impact on those creating records. Does the knowledge that their actions will be subject to public scrutiny inhibit public servants from formally recording discussion, debate and decisions? It is difficult to argue that this is not the case in the face of more and more evidence to the contrary.

In contrast to the situation in Hong Kong, New Zealand is proud of being one of the earliest adopters amongst the former British colonies of FOI legislation, replacing the *Official Secrets Act* with the *Official Information Act* in 1982. At the same time, however, organisational recordkeeping infrastructure was being rapidly dismantled in government departments, as part of New Zealand's very radical New Public Management approach, when registries were dispersed and records management positions lost in so many government departments.²⁴ Coincidental or not, it seems to reflect the concerns about the uneasy relationship between a legal mandate to provide access and reluctance to create and maintain records. It has only been since the implementation of the *Public Records Act* in 2005 that there has been a legislative imperative to develop and implement effective record-keeping systems. Evidence is now emerging, however, that suggests that deliberate strategies will be pursued in order to make sure that records of decision-making are not being kept. For example, in 2013 New Zealand's Department of Conservation was embroiled in controversy over discrepancies between a draft submission to a board of inquiry outlining serious concerns and the final version submitted, which did not signal any concerns.

23 Jonathon Dimbleby, *The Last Governor: Chris Patten and the Handover of Hong Kong* (London: Little Brown, 1998), p. 251.

24 Gillian Oliver and Kurmo Konsa, 'Dismantling Bureaucracies: Consequences for Record-keeping in New Zealand and in Estonia', *Journal of the Society of Archivists* 33.1 (2012): 89–107.

The involvement of the relevant government Minister in that process only came to light because a whistle-blower revealed that a verbal briefing had taken place.²⁵

The situation in Britain now with regard to freedom of information from a recordkeeping perspective is similarly intriguing. When the FOI legislation was finally enacted, it was accompanied by a code of practice relating to records management, which clearly emphasises the need for effective records management if the aims of FOI legislation are to be realised:

Any freedom of information legislation is only as good as the quality of the records to which it provides access. Such rights are of little use if reliable records are not created in the first place, if they cannot be found when needed or if the arrangements for their eventual archiving or destruction are inadequate. Consequently, all public authorities are strongly encouraged to pay heed to the guidance in the Code.²⁶

By accompanying the legislation with clear guidance as to the essential recordkeeping infrastructure required, it could be assumed that Britain would avoid the New Zealand scenario described above. However, the situation in Britain today indicates that, even if there had been high-level recognition of the need for records management to support FOI requirements in New Zealand, it still might not have had the desired result. Elizabeth Shepherd and colleagues have concluded that, despite the rhetoric, records management still may not be regarded as particularly important in local authorities in Britain:

... whilst superficially FOI seems to have facilitated a change in the perception of records management, how deep the culture change has actually been and how far it has penetrated organisations beyond the front-end customer interface can be questioned.²⁷

25 Andrea Vance, 'DOC Launches Dam Leak Inquiry', *Stuff*, 24 September 2013. Available at www.stuff.co.nz/national/politics/9202971/DoC-launches-dam-leak-inquiry (accessed 7 October 2015).

26 *Lord Chancellor's Code of Practice on the Management of Records ...*, 2002 http://www.proni.gov.uk/lord_chancellor_s_code_of_practice_-_section_46.pdf (accessed 5 November 2015, but subsequently updated in 2009 and accessible at www.nationalarchives.gov.uk/documents/foi-section-46-code-of-practice.pdf).

27 Elizabeth Shepherd, Alice Stevenson and Andrew Flinn, 'The Impact of Freedom of Information on Records Management and Record Use in Local Government: A Literature Review', *Journal of the Society of Archivists* 30.2 (2009): 227–248.

So, even though legislation might be in place and explicit codes of practice issued, people's attitudes to recordkeeping and values accorded to records will still be instrumental in influencing successful outcomes. It is of enormous importance to recognise this and not to assume that the intent and purpose of FOI legislation will be upheld if appropriate policy is developed. On the contrary, if there is a fundamental resistance to FOI ideals and aspirations, there may well be disastrous consequences for organisational and even national memories. This inevitably draws us back to the need to adopt recordkeeping informatics perspectives and not assume that a focus on end-product records management will be sufficient.

3.6 Standards

Standards that establish codes for best practice are extremely significant in many ways for recordkeeping informatics. Standards may be applicable internationally, nationally or be industry- or sector-specific. As with legislation, as well as being specifically relevant to recordkeeping systems, standards may also be applicable to the functions of the organisation. Recordkeepers will most definitely also need to ensure they are cognisant of the connections between standards and legislation applicable to the functions of their organisations and be aware of any legal ramifications for their responsibilities in implementing standards.

The world can be said to be awash with standards.²⁸ Those most prominent in the recordkeeping universe have been developed by the International Organization for Standardization (ISO), a non-government organisation comprising a network of 145 national standards bodies. It promotes the development of standards in order to facilitate the international exchange of goods and services and to develop international collaborative activity. ISO standards are the result of negotiation and agreement among its national member bodies.

The ISO family of recordkeeping standards, including ISO15489, 23081 and 33000 among others, are the key tools for use by recordkeepers to build and promote a recordkeeping culture. They should not, however, be regarded as providing fine detail about how to do things, which is impossible given the contextual nature of recordkeeping. The contextual nature of recordkeeping has led us to view it through the lens of information culture,

28 S. Timmermans and S. Epstein, 'A World of Standards But Not a Standard World: Toward a Sociology of Standards and Standardization', *Annual Review of Sociology* 36 (2010): 69–89.

which emphasises organisational analysis and understanding. With the insights that that approach brings to recordkeeping, however, the record-keeping guidelines, as represented in the international standards, can be interpreted and applied effectively.

3.7 Compliance

So, if requirements are contained within legislation, how do you make sure that the legislation is being followed and that the desired outcome is being achieved? Methods of ensuring this will evolve over time, as we learn more about behaviours in the workplace and responses to recordkeeping requirements in different cultural settings. One approach being taken in Australia and New Zealand now is by audit and the completion of a compliance regime. The Victorian Auditor General outlined the key characteristics of a sound regulatory system:

- Setting the requirements
- Managing the relationship between the regulator and the entities subject to regulation
- Monitoring compliance
- Managing non-compliance
- Promoting sound records management
- Reporting on compliance with regulation
- Ensuring the rules remain relevant.²⁹

A number of different models have been introduced into other jurisdictions to provide a compliance framework. The goal of all compliance models is to elevate attention to recordkeeping as a strategic issue for all public offices. Given the relatively recent commencement of the comparable legislation, it is too soon to tell with certainty which models work best. Anecdotally there is evidence to suggest that a strong recordkeeping compliance method, such as requirements to create plans and audits, has affected the attention of senior managers to recordkeeping. Whether these are short-term attention-winners or whether they achieve the goal of increasing the strategic management of records, thus influencing the Level One Information Culture Framework characteristic, the value accorded to recordkeeping processes, remains to be seen.

29 D.D.R. Pearson, *Records Management in the Victorian Public Sector* (Melbourne: Victorian Auditor-General, 2008).

Providing compliance models where the standards-setter is also the auditor against the standards conceptually raises a conflict of interest. This model also potentially diminishes the impact of the auditing function. Without the profile, authority and independence of a body such as the Auditor General's Office, there is a risk that such audits may be ignored by large and powerful agencies and/or political interests.

NSW State Records and the National Archives of Australia have both utilised the services of the independent auditor of their respective jurisdictions. Anecdotal reports indicate that this experience has not been without its problems. Auditing bodies are reported to have underestimated the complexity of recordkeeping, the specialist knowledge and time that such audits would take. However, it is undeniable that their reports have had considerable impacts within their own, and other, jurisdictions.

The Western Australian model and the New Zealand model are the two strongest compliance models. Both jurisdictions had to bear an implementation cost. In Western Australia, additional resourcing was initially required for three part-time staff to join a recordkeeping team of four full-time staff so that the State Records Office could establish requirements for recordkeeping plans, create appropriate training materials and approve recordkeeping plans for all agencies of government (about 300 agencies). Given that these plans are compulsorily reviewed every five years (and all plans must be approved), this resourcing requirement will be ongoing. At Archives New Zealand, the introduction of compulsory audits required the formation of a new team and some initial capital expenditure. The first annual report on the outcomes of the audit process there had a very mixed reception,³⁰ and the future shape of the audit programme remains unclear.

The principle underlying compliance regimes is assessment of the extent to which legislative requirements are being fulfilled. A jurisdiction-neutral approach can be outlined as follows:

- Identify the external requirements, e.g. privacy legislation
- Check to see whether these requirements are reflected in organisational policy.
- Find out whether staff are aware of these requirements.

30 Mike Steemson, 'First NZ Public Records Audit Report Disappoints Professionals', *IQ* 29.1 (2013): 7.

- Develop a training programme to address the gaps identified. Making sure that the requirements are linked to the legislation will help explain and justify the existence of organisational policy and will establish that these are not arbitrary dictates.

This assessment, evaluation and action process is summarised at Level Two of the Information Culture Framework and is an essential component in building and developing a recordkeeping culture.

3.8 National and Transnational Settings

Our perspective in this chapter is very much of and from the organisation. As a reminder of the extent to which organisations are embedded within a broad and complex environmental setting, it is important, however, to stress the presence of national and transnational settings. Each country will be subject to its own sets of influences, which will relate to its history as an occupying power or as occupied or contested territory.

In Estonia, for instance, formerly part of the Soviet Union and previously occupied by a succession of invading forces, archival, public information, data protection and legal deposit legislation has been updated in recent years.³¹ Given the amount of work required as a consequence of completely new ways of government and the growth of a new private sector following independence from the Soviet Union in 1991, the fact that these acts have received attention indicates the very high importance accorded to information as evidence and information as knowledge. By way of contrast, in a similar colonial legacy environment to that of Australia and New Zealand, Hong Kong was in a comparable situation in terms of the magnitude of change as the territory was handed back to China from Britain. The legislation enacted in Hong Kong, however, in the lead up to the British handover showed that information management concerns were not a priority.

Organisations in Australia and New Zealand, the environment with which we are most familiar, are also subject to differing cultural influences that shape recordkeeping processes. They may be less dramatically marked than a small Central European country, prone to occupation by its more powerful neighbours, but they are without doubt still apparent.

31 See 'Estonia: Access to Information and Data Protection', *Legislation Online*, at <http://www.legislationline.org/topics/country/33/topic/3> (accessed 7 October 2016).

3.8.1 Language

As we discussed in Chapter One, language has emerged in information systems design literature as being of concern in enterprise architecture.³² Although English has emerged as the *lingua franca* for business, the need to communicate and exchange information in other languages cannot be ignored and may be a key consideration in determining organisational settings. Evolving technologies to provide instantaneous online translations are starting to reduce some of the issues relating to accessibility to information in other languages, but the overall impact of these tools remains to be seen. Languages are not simply exchangeable codes, where equivalence of words and phrases can be mapped to others, but they can reflect fundamentally different approaches to communicating information.

One broad categorisation that can be applied to languages is distinguishing between those of high and those of low context. As the name suggests, a high context language (such as Japanese) is where high importance is accorded to the context in relation to the content of what is being communicated, whereas in low context languages (such as English) the message has to be made explicit in the content. The differences between these two extremes have been associated with preferences as to textual versus visual representation of information. There is undoubtedly a need for much further investigation in this area, which has the potential to be very significant for conducting business across national boundaries.

Perhaps online translation tools will mean that the quantity of information in non-English languages will increase on the web. There are particular challenges associated with languages that use non-Latin scripts and there are implications associated with the use of different character sets for digital accessibility and sustainability issues. Here, the use of standards for encoding to take into account diacritical elements in different languages is extremely important if there are aspirations to enable equal access to people speaking those languages. These concerns are very apparent where indigenous or minority languages need to be protected and promoted, such as in former colonial countries like New Zealand. But in Europe similar situations may exist and regulatory settings established for these purposes.

32 Mark Aakhus, Pär Agerfalk, Kalle Lyytinen and Dov Te'eni, 'Symbolic Action Research in Information Systems: Introduction to the Special Issue', *MIS Quarterly* 38.4 (2014): 1187–1200.

Estonia provides an example of a country where the language used in business transactions has changed over time because of political considerations. The country's national awakening in the late nineteenth century was preceded by a steady increase in publications in Estonian; similarly towards the end of Soviet occupation the status of Estonian was a key issue.³³ Changing relationships with occupiers has influenced the choice of languages that should be taught in schools. Now that Estonia has regained independence, English, as the language of commerce, has emerged as the preferred second language. This means that future Estonian citizens will have limited or at least mediated access to the archives of their recent past, as individuals may not have the linguistic skills necessary to be able to read and understand those records. Similar stories are played out in the postcolonial world as countries reposition, reclaim lost or suppressed languages, and form new alliances with world powers, with consequences for preferred second-language teaching.

3.9 Conclusion

The purpose of this chapter was to introduce a way of identifying the influences and settings that need to be understood in order to develop an effective recordkeeping culture. The enormity of the challenges facing us can seem overwhelming, as we are in an age of profound change. Technological developments and the potential for transnational endeavours combine to form a powerful cocktail of influences, the true flavours of which are yet to be revealed. WikiLeaks has demonstrated the potential of these influences.³⁴ The major lesson to be learnt from WikiLeaks is, as Umberto Eco has observed, that it has opened up a new chapter in history in which 'no government in the world will be able to maintain acres of secrecy if it continues to entrust its archives to the Internet or other forms of electronic memory'.³⁵

33 Toivo U. Raun, *Estonia and the Estonians*, 2nd ed. (Stanford: Hoover Institution Press, 2001).

34 WikiLeaks (WikiLeaks.org) was launched in 2006. Created by a multinational group of journalists and supporters, most notably Julian Assange, it had the clear intention of creating a pan-national mechanism to anonymously release leaked documents. The enterprise started small, emulating the Wikipedia structure with the intention of enabling all interested internet users to annotate and post interpretations of the leaked material. Quite quickly, the contributory aspect of the site changed, while retaining links to some sources that had used or provided commentary on the leaked documents.

35 Umberto Eco, *Inventing the Enemy* (Random House, 2012), 219.

In fact, trust in the security of the archives can often be maintained if recordkeeping cultures result in better granular control and management of recorded information about our actions, but, nevertheless, we all have to start living with the collapse in the boundaries between the internal and external storage of recorded information. Cloud computing, and whatever follows cloud computing, will accelerate this already emerging trend.

THE MATURATION OF BUSINESS RECORDS MANAGEMENT

4.1 Nanosecond Archiving and the Direct Recording of Business Activities

Adequate recordkeeping as a basis for business records management in the twenty-first century seems to have become too hard for many organisations. Inadequate recordkeeping is not universal and much is beginning to be achieved, but it is a common phenomenon nevertheless. Individuals are proving quicker than organisations to adjust to the potential of agile forms of computing. It is easier for solo operators to relate directly to the changes in technology, especially if they have no personal legacy from past information cultures and are just entering their business fields.

The increasingly personal nature of the best form of business records management was brought home to two of the authors of this book coincidentally on the same day. We both saw the marketing slogan ‘Perform. Record. Manage’ of the JMC academy affiliated with the Australian Council for Private Education and Training (ACPET).¹ One of us saw the slogan on a bus and the other saw it in a music journal telling us it was the path to a creative future. JMC runs courses in music, audio engineering, and entertainment management. If you are an artist, a support technician, or music entrepreneur trying to make your way in a complex digital world, then business records management is important for your economic survival.

The slogan coincides with a major business records management motif in this book. Within modern computing there is a need for nanosecond archiving to capture direct relationships between actions, recorded inscriptions and business processes. In recognition of that need, performance-based

1 The slogan was also prominent on ACPET’s website, jmcacademy.edu.au, accessed 13 January 2014.

artists are being encouraged to creatively and directly manage the inscription cascade using the recent advances in modern technology. Authoritative information resource management matters to the life-chances of these artists, many of whom have been brought up in the new agile world of internet-enabled objects (IOTs). Their information culture and their business activities require a disciplined focus on the performance, the record (in its many forms and meanings), and the management of both. Such individuals are moving into the networked age where they are finding that recordkeeping is a survival mechanism.

The wave of change is being embraced less enthusiastically within organisational information cultures. Their recordkeeping informatics has not been robust. Agile computing does not easily connect with organisational business systems, which, over the last thirty years, have been increasingly filtered by data and information processing requirements rather than derived from direct understanding of and involvement in the business transactions themselves. The technology of social media, user-enabled recordkeeping and nanosecond archiving are providing fundamental challenges to those organisations where ownership of and responsibility for data have been placed increasingly in the hands of end-users while organisational information and enterprise architectures and policies, particularly in governments and large non-government organisations, have often been pulling in the opposite direction towards data-dominated application platform interfaces within a dependence upon electronic memory systems. It is often a double failure; a failure to manage their application platforms and a failure to manage the storage of the records of action. Apart from the business process problems this can cause, organisations are experiencing problems in keeping their leviathan information systems secure from the raids of hackers and leakers. They build firewalls that tease and encourage hacking, but fail to imagine architectures that jointly and directly connect their business activities with information systems and information management in ways that make appropriate decisions about where to store information within graded security levels.

As we argue throughout this book, especially in Chapter 2, the legacy of the paper era is part of the problem. Records management developed first as a proto-discipline in the United States as a way of tackling the management of an expanding number of physical end products from business actions. In other Anglophonic countries the term records management was applied to both end-product management and the operation of recordkeeping systems that maintained direct contact with business processes. In its

mature forms in Australia in the 1960s, for example, most Commonwealth government agencies knew how to construct activity bundles. There was a complex mix of administrative correspondence registries and a plethora of operational and housekeeping series of records which captured records across all of an organisation's activities. Serialisation of records combined information management and information systems design and development tasks.² These once relatively transparent and deceptively simple processes now increasingly need to take place behind and beyond internet-enabled objects. Recordkeeping has been losing much of its physical visibility, requiring a disciplined expansion of human skills and knowledge. The main records management issue for organisations is no longer the management of individual physical objects or servicing the management core of that organisation; it is whether particular types of transactions within the organisations require authoritative forms of information resource management or can simply be managed as end products.

What is making the need to address this issue particularly urgent is the way cloud computing has been coming with a rush, which is most apparent within personal systems and applications. Social media, which is characterised by the rapid take-up of agile forms of computing that involve direct recording of inscriptions and clever web-based applications, have been embraced by individuals. From an authoritative information resource management perspective, however, cloud computing highlights the poor state of business records management and the hollowness at the heart of many of the (wonderful) technological innovations emanating from the US. Cloud computing techniques as developed so far simply do not comprehend the complexities of recordkeeping informatics as part of organisationally based business records management.

This chapter will expose many of these unknown complexities and will imagine and explain a pathway towards greater maturity in the way an organisation connects its business processes with recordkeeping needs. Two forms of sociology will underpin the explorations. One is the relationship between structures and action within structuration theory, using Anthony Giddens' four-dimensional construct for societal spacetime distancing processes which will be outlined in the next section of this chapter. The other is the recordkeeping-based version of Actor–Network Theory outlined in the first and last parts of this book, in which we imagine a network of

2 Ian Maclean, 'Australian Experience in Records and Archives Management', *American Archivist* 22.4 (1959): 383–418.

informatics professionals capable of contributing to the efficiency and effectiveness of modern organisations as bundles of activity within a world of rapid communications and cascading inscriptions. Both forms of social theorising will be directed at establishing a major recordkeeping informatics goal, which is the adequate nanosecond archiving of inscriptions accompanied by consciously selected data about the relationships between agents, business activities and the record of business action in ways that, as far as can be imagined and implemented, will manage and accompany the trajectory of objects through spacetime.

It will also open up a perspective on how to adjust diplomatic science, an archival approach that directed attention to the need for protocols in the form of individual documents, to a world of cascading inscriptions.³ Business-acceptable communications are in flux, and new rules need to be developed that also act as a resource by regularising the control of transactions in ways that make them acceptable. Modern information spaces offer particularly complex, but navigable, situated contexts for new protocols. The potential is there, but so far diplomacy has not matured enough for this to take place consistently and coherently.

Above all, it will take an evolutionary approach to the cognitive, social and technological maturity that recordkeeping informatics as a disciplinary construct can bring to business records management. To give an example of the sort of projects that will drive the evolution of greater maturity, the Australian and New Zealand governments have jointly begun to develop cloud passports, which they claimed in 2015 to be a world first.⁴ The potential for such a system has been tucked away in the technologies for more than twenty years, but only now are mature business records management uses for the marriage between internet and web-browsing technologies beginning to be pursued. Cloud passports will be part of an evolutionary phenomenon, because there are tens of thousands of 'world firsts' awaiting mature forms of authoritative information resource management. Such applications can and should run the gamut of human activity but the focus of this book is on business activities. Such applications include the

3 Luciana Duranti, *Diplomatics: New Uses for an Old Science* (Lanham, MD: SAA and ACA, in association with Scarecrow Press, 1998) (Originally published in successive issues of *Archivaria*, 1989–1991).

4 Latika Bourke, 'Australia to Trial Cloud Passports in World-first Move', *Sydney Morning Herald*, 29 October 2015. Available at <http://www.smh.com.au/federal-politics/political-news/australia-to-trial-cloud-passports-in-worldfirst-move-20151028-gkkr3.html> (accessed 9 October 2016).

EDRMSs that are the rump of once powerful organisational systems for bundling their business activities. They also include applications connected to banking processes, music dissemination, transporting and burying bodies, running a government-funded home insulation scheme, and any other business activity producing communications capable of being recorded and bundled together.

In short, agile computing, when tied into recordkeeping-based forms of business analysis offers organisations a chance to rediscover the power of the agent–business process–records relationship via internet-based business applications. The strengths and weaknesses of a cloud passport system will depend almost entirely on the strengths and weaknesses of the many records management applications that it will need to draw upon, along with the civil regulations needed to acquire and manage those records. The same will be true of countless other business applications awaiting development with the help of a recordkeeping single mind.

4.2 The Structuration of Records Behind and Beyond Internet-Enabled Objects

Because there is so much baggage from the paper era surrounding business classification processes, some Australasian archivist/records managers have been looking for a new term that can rejuvenate thinking and practices about how to bundle activities and cope with the expanding diversity and complexity of business communications. Whereas records management classification systems classified records, in digital recordkeeping we need systems that stretch across the artificial divide between records and archives. An Australasian expert on recordkeeping classification techniques, Chris Hurley, noted the emergence of an alternative while recommending a discussion on a New Zealand list:

If you're not on that List and are interested in the structuration (formerly known as classification) of records you should find a way of viewing it. You will be stimulated to ask questions such as: 'is it about document control (a worm's-eye view) or context control (an eagle's-eye view) or is it about both?' and then 'what else might it be about?' and 'what is it that we need to be about?'⁵

5 Chris Hurley, post 1563 to the Australian Society of Archivists list (archives-and-records-Australia@googlegroups.com) on 27 July 2015.

Structuration refers to theories that address the inter-relationships between our actions and the structures in which they take place. In the English language the best known of such theories is that of the sociologist Anthony Giddens who set them out in his book, *The Constitution of Society*. Hurley, in using the word structuration, is referring to Giddens' dimensional approach to spacetime distancing, which was first used in the archival profession to discuss the structuring of records in the 1990s using a records continuum model that grouped and classed the characteristics of information objects on the basis of their use in the carriage of information across spacetime (see Chapter 7).

Giddens' approach has already been purloined for our purposes in this book in our explorations of the meaning and nature of authoritative information resource management. Spacetime distancing, from an organisational viewpoint, should be a key consideration in the management of business activities. Within Giddens' theorising, it is fundamental to the life-chances of an organisation. It matters to mutual associations with others, establishing and maintaining an evidential base for any claims you might make on them or dealing with claims they might make on you. It enables management of business activities in different spaces and over time.

Table 4.1 summarises the connections that can be made between Giddens' dimensions and nanosecond archiving from a records continuum perspective. Nanosecond archiving is represented symbolically ($P_R_A_A^\infty$), with connected underscoring to indicate the most significant difference between archiving processes in the digital era and in the paper era. The connections need to be made in nanoseconds, not in leisurely fashion. The formula $P_R_A_A^\infty$, signifies:

- a performance dimension (the moments when action takes place) [P];
- a basic records capture dimension (varying from loose capture of an inscription to detailed capture of recordkeeping metadata along with the object) [R];
- a time-space distanciation dimension (the organisation of objects in ways that equip them adequately for necessary or likely spacetime journeying) [A], and;
- a plural dimension (the plurality of cognitive, technical and social factors influencing recordkeeping processes) [A^∞].

In the paper era those processes could be temporally and spatially separated. Records management classification processes guided routines within

elementary or complex filing structures. You could organise an archive in piecemeal fashion, even establishing a records centre for relatively current records and an archives centre for the older stuff. Pluralisation was an option largely controlled by the organisation itself and its willingness to participate in broader archival programs. Internet-based business applications these days however, have to come to terms with exploring and managing the expanding complexity of the structuration of records across these dimensions. The exploration component includes exploring protocols for identifying whether, in a particular time and place, an application works well, has broken down, or is in flux.

Table 4.1 Parallels Between a Sociological View of Spacetime Distancing and Nanosecond Archiving⁶

Spacetime Distancing (Giddens, 1984, p. 298, with Frank Upward's annotations in italics)	Nanosecond Archiving (P_R_A_A ∞)
Interaction Intersections of regions and a spatial spread away from the immediate contexts of interaction <i>(Perform, e.g. within business-acceptable communications)</i>	Perform (P) The creation of cascading inscriptions within the interactions during the performance of actions by people or their instruments
Routines Routinisation which provides a temporal spread away from immediate contexts of interaction <i>(Record, e.g. registration processes as a way of controlling temporality)</i>	Record (R) The routinisation that captures the inscriptions and sets up a temporal spread away from immediate contexts of interaction
Distanciation Time-space distanciation <i>(Archive – the formation of organised repositories)</i>	Archive (A) The organisation of an archive of activities equipping inscriptions for further collective spacetime journeying
Totalities and forms of the societal totality <i>(The archival multiverse)</i>	Archives (A∞) Pluralisation (the archives as the container of the totality of recorded information)

In this multi-dimensional view there is one dimension of action and three dimensions structuring that action. Similarly, in digital recordkeeping informatics, the control of the formation of the record of action depends

6 Frank Upward, 'Structuring the Records Continuum, Part One: Postcustodial Principles and Properties', *Archives and Manuscripts* 24.2 (1996): 268–285.

upon the structures that have been set up. If the controls are not present and not enacted during moments of interaction, the only effective chance to set up a spacetime trajectory is lost. To manage that trajectory, advanced thought about routines for beginning the spacetime journey, together with organisational and plural archival structures, must have been undertaken and translated into routines that are in place for use from the moment the inscriptions are created or received. The formula $P_R_A_A^\infty$ is modern business records management's equivalent of the JMC academy's slogan, 'Perform. Record. Manage'.

It is easy to look away from the problems caused by the immediacy and scale of electronic memory storage. The technology is marvellous; social media gives us all the power to express ourselves, and cyberspace is a hyper-Utopia based on enjoyment of the present moment. When the $P_R_A_A^\infty$ formula is forgotten, neglected, or mismanaged, major failures can arise over time and in different spaces. Our technologies, despite their power, are creating conditions for crime, incompetence and terror. Part of the problem is the unsophisticated view of information storage in action that is embedded in the application of many of our technologies. For business purposes, storage is a complex issue involving decisions about what should be in the back office of an organisation and what should be available from the front 'web' office. Separate and linked stores can be set up to serve individual, group, and organisational needs, while the new plural archives is forming in the cloud without adequate attention being paid to the bundling of activities and the existence of both public and private clouds within business processes.

Internally organisations can set in place policy and procedures, but the person at the desktop or using the IOT has greater control over what applications, systems and policies or procedures to follow. Hurley, in the above quotation, refers to this as the 'worm's eye' view of business process, but, if it is, the worm has turned. The agent of action has always been the sharp point of an organisation, the one involved in the immediate contexts of interaction, but never have organisations been so much at risk from them. One sign of an organisation's lack of sophisticated approaches to storage can be found in the ease by which the present moment's business record can be tomorrow's newspaper headline. Their agents of action can financially cripple organisations or leak masses of data almost at the press of a save or forward button.

Recordkeeping linearity from the paper era might now be dead, but there is a clear need to reinvent it as recordkeeping informatics. This need should

be part of the process of developing mature internet-based business applications that address spacetime distancing; such a reinvention of business records management needs to start with the management of the situated contexts of action. The control of those moments involves establishing routines, considering the time-space distancing needs of bundled activities, and thinking about the social totality into which the controls are being introduced. Logic might suggest that we should now discuss routines, but that logic is not the logic of structuration theory. A discussion of organisational control of recordkeeping informatics is best begun with an eagle's eye view of the plurality of the social totality, looking at some of the cognitive, social and technical forces that have and will shape the future complexities of that once seemingly simple task, business records management.

4.3 The Cognitive Maturation of Recordkeeping Informatics

No organisation has ever been an island, but the interdependencies of organisations, with each other, and with the social structures in which they work, have never been so obvious. This plurality of interdependencies is increasingly significant, whether one looks at it through the prism of cognition, of social factors, or of available technologies. If we start our exploration of the forces shaping the immediate contexts of interaction in business records management with cognition, our own practical grasp of the basic connections with knowledge formation owes much to the research and collaborative projects that have emerged from the work of the Centre for Organisational and Social Informatics at Monash University. The Centre has brought together research structures and action in a networked fashion, making more apparent the potential power of new ways of bringing together records management and archival administration within technical frameworks. Placing organisational and social informatics side by side enables the eagle-eyed view of time-space distancing required in organisational recordkeeping to be placed alongside perspectives and additional meta-views from many sources.

That combination of organisational and meta-level perspectives has a physical reality within the immediate situated contexts and spacetime distancing power of networks, especially professional networks. Paul Duguid's comments on the development of the informatics of accountability over a long period of time help clarify what we have in mind when we call for the development of greater informatics professionalism:

For half a millennium, bookkeeping, a system of individual blocks or *lexias* interconnected by multiple links, created and maintained networks of information, ‘books mutually dependent on each other’ as the *Catechism of Trade and Commerce* called them. A conventional set of account books comprised several generically quite different types of document: the waste book, the journal, the ledger (with its distinct types of account), the letter book (with its many authors), the bill book, the cash book, the sales book, the inventories, and so on. The accounting system also embraced several media, including physical objects (goods, merchandise) and complex intermediate representations (tags, tallies, chits, receipts, bills of lading, and the like). Items, books and sets of books were elaborately linked in ways that connected items not only to those in the other types of books within a single business but to other books in other businesses (for of course every credit in one ‘real’ account is a debit in someone else’s; every bill receivable represents a bill payable elsewhere).⁷

Accounting informatics is shown to be what Duguid describes as a never-ending global hypertext network with ‘ever-new and perpetually unfinished pathways created by each new reticulating reader–writer’. Everything is a peripheral part of the whole and yet, hypertext fashion, becomes a central component of that whole when it is focused upon.

This is entering into the archival multiverse (that is, the plurality of recorded information) as an expanding and diversifying totality that in its parts can take many complex shapes. The runaway expansion of modern information and communication apparatus that can be plugged into the Internet demonstrates the power of many reader–writers exploring and complexifying unfinished pathways in the manner described by Duguid. Another example is the growing presence of retrieval mechanisms that can instantly interrogate vast swathes of data and information. Not surprisingly, people now have large dreams and very high expectations of how records can be used to get to the truth of something. Cold-case television programs, for example, repeatedly suggest that there are very few problems involved in implementing authoritative information resource management. The required hypertext networks are assumed to already exist. Imaginary

7 Paul Duguid, ‘Material Matters: Aspects of the Past and Futurology of the Book’, in John Seely Brown and Paul Duguid, *The Social Life of Information* (Boston: Harvard Business School Press, 1996), 63–102. Available at http://people.ischool.berkeley.edu/~duguid/SLOFI/Material_Matters.htm (accessed 9 October 2016).

forensic investigation units regularly engage in re-opening unsolved crimes using improved forensic techniques to reinvestigate the archive. In the time-frame of a television program, fictional doctors similarly engage with the record, working through the elaborately inscribed medical data of individuals and trawling across human diseases in order to identify ailments and locate cures. New forensic techniques, our entertainments tell us, can be used to catch criminals, follow money trails and sort through masses of highly complex medical data instantaneously.

Beyond fiction there is a truth to stories about the advances in forensic technologies when they are applied to records that are directly linked in with business activities. Plane-crash investigators mull over the evidence and use tools such as black-box flight recorders to establish the most likely causes, often to a high degree of certainty. A hospital's medical records are increasingly built using new technologies that feed directly into the patient record. Ways of establishing and following the direct connections in money trails become more sophisticated by the month, if not by the day. Meanwhile, in the netherworld of often poor connections between agents, action and the record, many people dispute consensus-based scientific data about what is being done to the planet, let information about the acceleration of global corruption wash over them, lose track of where bodies are buried in cemeteries, or run government programs that unintentionally burn down houses and kill people.

In other words, the ability to form knowledge using records of action is a curate's egg; parts of it are great, parts of it stink. In Chapter 2 we discussed how, over the last hundred years, many organisations gave up on the adequate bundling of communications and business activities because there was too much transactionality to deal with, but not all organisations have been playing the game badly. We also need to happily acknowledge here that our much-vaunted recordkeeping single mind can often appear to be absent without affecting organisational business processes. It does not take a professional recordkeeping background to have such a mind. Sometimes the need for authoritative resource management is so strong that any mind undertaking business activities will take it into account. When you draw money out of an automatic teller machine, the application that is activated has to perform the withdrawal on your behalf, capture a record of the transaction for both you and for the bank, and rebuild the archive instantly. Systems designers and developers will have this in mind when developing protocols for the use of the machines. Other groups in society, such as those

involved in internet-based performing arts (as we have seen already in this chapter), have to consider records capture and archival formation as part of their business processes. For them it is a fundamental business activity and they do not need recordkeeping informatics as a discipline to tell them to link activities, agents, and inscriptions. It is a matter of business records management sense.

We are, however, only on the threshold of using technology in ways that are aligned with common-sense views of the structuration of records. Even in areas of major advance in human knowledge there is always room for finding new ways to record actions within routines behind and beyond the screen or our instruments and a need to give plenty of forethought to how routines and an archive can be developed and can contribute to further action. Doctors in hospitals, for example, despite the fictions of television programs, find they have to struggle their way through a welter of information when making a diagnosis. There is a constant battle with the expansion of cascading inscriptions which adds to the complexity of trying to pin down causation in particular situations and calls for new ways of capturing and searching the data.

In this century authoritative information resource management will be a never-ending and never-stable task. In a clear example of the importance of the ongoing structuration of records within new pathways, it used to be possible to think that black-box flight recorders had got 'Perform, Record, Manage' under control for studying airline crashes. You could use post-flight downloads which were also an ongoing part of the data maintained by aircraft manufacturers. There was, however, a glaring weakness that became apparent following the disappearance of the Malaysia Airlines flight MH 370 in 2014; the black box has to be physically located to be used. In future, flight-data recorders will be connected in real-time to an external archive, or more likely to a number of them held in flight centres, airlines, or aircraft manufacturers. Cloud computing will have a literal meaning to add to its metaphorical one, and $P_R_A_A^\infty$ will be robust.

In summary, there is so much more that could be done in knowledge formation if we had a reinvigorated disciplinary base for authoritative information resource management and a network of agents speeding up the evolutionary processes via internet-based business applications. Such a base would be particularly significant for those organisations that are fighting difficult battles when addressing problems that are expanding in complexity, which in this decade is most of them.

4.4 The Social Maturation of Recordkeeping Informatics

If we shift from the cognitive role of recordkeeping informatics to a social role, we are entering into familiar territory for those archivists who have thought about the strong connections between archives, recordkeeping and social functioning. That theme is represented in this book by the motifs addressing the web of relationship between people, their transactions, and the inscriptions that are part of business activities and are stored within nanosecond archiving processes. Organisations used to think that they were the epicentre of such relationships, but, as with knowledge formation, plurality and networking, they are becoming more significant to the structuration of records, to the extent that it is stating the obvious to note that organisations are increasingly recognising the need to be part of an interconnected world.

As an illustration of this expansion of significance, archivists at the leading edge of archival research are exploring the obvious fact that transactions are two-sided. What organisations used to think of as their domain, namely the creation of records by them, is in reality a process of co-creation.⁸ Logically, it always has been the case. Organisations are a form of community to which societies have given 'body corporate' rights, obligations, and duties mirrored on the rights, duties and obligations of individuals. Both individual and corporate rights and obligations can be involved in transactions. The law in most countries has found ways to recognise this duality of rights within legal systems, but organisational boundaries are becoming more permeable, and, in both business and government, as much of the work as possible is being farmed out, extending the notion of co-creatorship. The farming out can be a form of outsourcing in which external agents act as third parties and can also involve very direct forms of co-creatorship. When undertaking banking processes, applying for government assistance, or doing supermarket shopping, for example, customers and clients often do much of the work and this will increasingly be the case within many internet-based business applications. Organisations are also expanding their boundaries within enterprise-based cooperative projects. Such changes

8 See, for example, contributions attributed to McKemmish, in Frank Upward, Sue McKemmish and Barbara Reed, 'Archivists and Changing Social and Information Spaces: A Continuum Approach to Recordkeeping and Archiving in Online Cultures', *Archivaria* 72 (2011): 197–237.

totally disrupt the comfortable but sometimes absurd notion from the paper era that organisations 'own' their records.

There might be nothing new in emphasising the significance to social functioning of recordkeeping processes for managing transactions. What is new is the complexity of modern issues, the amount of transactionality that is occurring, and the difficulties involved in implementing different recordkeeping requirements across internet-based applications. The fulcrum of twentieth-century laws of evidence was the document. Legal systems in the paper era governed access to it as an end product and established parameters for assessing its reliability as a provider of evidence. In this book, one of the clear changes from this standard position is our use of the word *inscription* in place of the now creaking term from the paper era, *document*. One issue that is already being considered within new approaches in legal systems to evidence is how adequately an organisation has managed the torrent of inscriptions. It has become increasingly difficult to ascertain the integrity and evidential value of individual objects, but honest recordkeeping processes and corrupt ones can be measured by the nature of the systems applications within which records are captured and the reliability of the record assessed on the basis of whether the capture mechanisms were operating in routine fashion. Twenty-first-century systems will also have to consider what records organisations are not creating. Is the failure to inscribe an action and keep it as record actually providing evidence that an organisation is dodging its responsibilities? If so, legal and social systems have to work out how to penalise such chicanery and put much greater weight on the 'other' record, the record that a second or third party to a transaction might have kept. They will also have to take into account the custodial responsibilities for inscriptions that have involved co-creatorship. They do not have a single 'owner' and disposition for such records should be subject to agreements.

For many archivists our linguistic switch from documents to inscriptions will not mean much. Documents and inscriptions have long been synonyms in archival discursive practices at their deeper level. Archivists, for example, like to cite the way Jacques Derrida connected the inscription process with governance in his book *Mal d'Archive* in which he presented a Freudian view of the way archives at the level of the document as an inscription are agents of impression, repression and suppression. Archivists regularly discuss the repressive and suppressive role of recordkeeping from a social perspective in ways that link to terror and totalitarianism. Recordkeeping by the Gestapo, the Stasi, and the KGB provide clear examples of Derrida's

argument.⁹ From this perspective, the absence of the recordkeeping single mind is a blessing. The East German Stasi, for example, kept information about citizens on cards in shoeboxes and exercised their arbitrary powers in less than effective ways. Imagine how brutally efficient and effective such an organisation could be today using big data techniques for inscription management.

A more constructive view for healthy social functioning can be developed by following on from the notion of an inscription as an impression of an event or happening. The archive of such inscriptions, while needing to be subjected to scrutiny for their value as evidence, supports transparency, accountability and authoritative resource management. Unhappily, it is the healthy view of recordkeeping that has been suffering most from technical change. The consistent and reliable management of the web of relationships between people, business activities and inscriptions has failed to keep pace with the changes in our information and communication technologies. Happily, this can be addressed within a more considered approach to the structuration of records and the development of recordkeeping informatics as a discipline. To do so, however, social reward regulations for application development need to mature. How can developers be given a fair reward for effort while economically providing software from business applications stores? How can quality authoritative resource management applications be given ticks of approval? How can the use of open-source software be demanded for significant forms of authoritative information resource management? The list of questions can, of course, continue.

4.5 Technological Maturation: A Fresh Recordkeeping Informatics Professional Perspective

When it comes to the third component of our definition of informatics, the technical aspects, we will make an argument here that will be carried out more intensely in Chapter 9. The maturation of technologies can be looked at from many perspectives, but focusing on the technology alone is, from an informatics perspective, amateurish. Networked informatics, as a professional pursuit, will include consideration of the social applications and cognitive uses of the technology. From this viewpoint, there is

9 See for example, Eric Ketelaar, 'Recordkeeping and Societal Power', in Sue McKemmish, Michael Piggott, Barbara Reed and Frank Upward (eds), *Archives: Recordkeeping in Society* (Wagga Wagga: Centre for Information Studies, Charles Sturt University, 2005), 277–298.

a world of difference between technological maturity and the maturity of the applications of technology.

Early technological maturity models focused on data governance. IBM, for example, in 2007, issued a data governance-based model built around the argument that data is being mismanaged because it is being ‘spread across multiple, complex silos that are isolated from each other’, making data governance a priority in most companies.¹⁰ This cliché has been repeated regularly since it was first widely discussed in government circles after the United States’ intelligence failures prior to the terrorists’ attacks in September 2001, The American government response in implementation, however, proved to be amateurish because it replaced many silos of information with one large and very vulnerable silo, as we will demonstrate in the next chapter.

We say amateurish, because it is not only better data governance that is needed. A much more professional informatics-based approach to networking across the complexity of different agency functions is needed. This more expansive requirement is beginning to be taken within modern technology maturation indices. The second edition of the Australian Strategic Policy Institute’s index for cyber-maturity in the Asia-Pacific region, for example, included for the first time a cybercrime category that joined their ‘continuing assessments of whole-of-government policy and legislative structures, military organisation, international engagement and CERT team maturity in addition to business and digital economic strength and levels of cyber social awareness’.¹¹ This is an early example of informatics professionalism – the sort of umbrella considerations that structure complexity, including, for business records management, the conduct of business activities and the future development of internet-based business applications.

A recordkeeping informatics model directed at business records management does not exist but some of its components are emerging in this book, including:

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- 10 *The IBM Data Governance Council Maturity Model: Building a Roadmap for Effective Data Governance* (Somers, NY: IBM, 2007), 2. Available at https://www-935.ibm.com/services/uk/cio/pdf/leverage_wp_data_gov_council_maturity_model.pdf (accessed 9 October 2016).
 - 11 Tobias Feakin, Jessica Woodall and Liam Nevill, *Cyber maturity in the Asia-Pacific Region 2015* (Barton, ACT: International Cyber Policy Centre, Australian Strategic Policy Institute, 2015). Available at <https://www.aspi.org.au/publications/cyber-maturity-in-the-asia-pacific-region-2015> (accessed 9 October 2016).

- authoritative information resource management in general,
- systems and applications for cyberspace that combine, rather than fragment, information management and information systems design and development issues,
- the ability to bundle activities during communication processes,
- the capacity to cope with an expanding number of inscriptions related to business activities,
- the ability to establish direct relationships between records, agents and processes,
- the development of archivally approvable internet-based business applications.

Each branch of informatics, whether legal, medical, financial or directly information-based, will, like recordkeeping informatics, have its own index points to add to a maturity model, but professionally all will be connectable to authoritative information resource management. Is the technology being adequately used to address spacetime management issues, to harmonise mutual associations, or to assist in promoting individual, group, organisational or social life-chances?

For recordkeeping informatics, one of the best litmus tests for the authoritative resource management elements of technological maturity will be the emergence of more robust paperless offices. We say robust, because for more than thirty years such an office has been a marketing slogan and something of a running joke amongst archivists. Over that time there seems to have been more paper in our offices than ever before, as sales figures of scanners, printers, photocopiers and copying paper can prove or disprove. The result has been hybrid offices, where neither the paper nor the electronic record tells the full story of action.

Gradually the components of a true storage-based singularity for business activities has been assembling and it is becoming closer to reality but still many of those whose expertise is in the technology, not the business processes, oversell the part their technical expertise can play in its adoption. For example, in Australia in 2015, Telstra launched a campaign to sell the paperless office to small businesses built around mobile forms of cloud computing. What they can reasonably offer is explanations of their technologies and services. They can explain how some customers are using the technology, what recordkeeping metadata the Australian government will demand that telecommunication companies provide to them, how

vulnerable electronic communications are in the digital age, and many other issues within their realm of experience. What they almost certainly cannot explain is how to knit together business processes and the actors involved in both sides of a transaction. Their advice on how to mesh together information storage in back, front and cloud receptacles will be unprofessional. As for the business bundling of electronic communications, the methods they will offer, in comparison with what we are leaving behind, are very immature. If vendors of the paperless office can help businesses, small or otherwise, work through this web of nanosecond archiving relationships, there is obviously more chance that the paperless office can be a robust reality.

Part of the difficulty in implementing the paperless office in robust fashion is that technological change is constantly changing shape and so much ongoing commercial activity benefits from obsolescence. If the trend towards big-data systems in the 1990s led to an emphasis upon data governance in the first decade of this century, the technical trends towards agile computing can now take implementation issues into more sophisticated forms of governance relating to cognition and social uses. There has been a lack of strategies, tactics and structures for authoritative forms of information management and information system design and development that matches the evolutionary pace of ICT change. A key maturation point, we contend throughout this book, will be how comfortable an organisation is in maximising the use of internet-based business applications and, at national, local and global government levels, how much support is given to application stores containing archivally approved business records management applications that can be drawn down, tailored, and updated or replaced with due consideration of forward and backward data compatibility. Within this porcupine style of archival architecture, applications can generate new applications, the kinetics of change is recognised, and fractal-based case-by-case ways of addressing the complexity of the structuration of records can be put in place.

4.6 The Archive and Time-space Distanciation

Having reviewed the cognitive, social and technical totalities in which the structuration of records takes place, it is time to return more fully to the main focus of this book, the organisation. Within the basic principles for the structuration of records, this involves focusing on the archive. Earlier in this chapter we considered a slogan [Perform, Record, Manage] used in the

education of performing artists and their entrepreneurs. We could change *manage* to *archive* in this slogan. In its classic Greek and Latin meanings the *archive*, as a process, can be seen as the arch of governance. It is also a label for an organisation's or individual's body of records as a means of time-space distancing. Spacetime distancing processes span the reach from immediate contexts of creation to the societal totality. Within that span, Giddens' dimension of time-space distancing is more noticeably temporal, directing attention to community, social or organisational needs over time. The directors of a company or the managers of an organisation are not just responsible for day-to-day activities. Their deeper responsibilities are to the organisation's temporal sustainability, even if it is only measured by crude yardsticks such as the price of a share.

The word archive, like many other words connected to recordkeeping processes, suffered damage near the end of the paper era as a result of a logically dysfunctional drive to separate the archive in linear fashion from the record. The archive can, of course, be the old stuff, and certainly relates to temporal sustainability, but, like anything else, it cannot be formed other than in the moments of action, the flicker by which the continuum of recorded information is always renewing itself in expansionary mode. In the paper era, time-space distancing could be a relatively leisurely pursuit. Policies, systems, implementation, and management techniques had a number of centuries over which to mature. Now that archiving is no longer a transparent process and is taking place beyond and beyond screens, the leisure has disappeared. The archiving processes are set up in the moments of creation, or the moment is lost. The technical changes cannot be held back and we need to look hard at modern time-space distancing problems. Something is being lost that needs re-establishing in new ways.

Agile computing can provide those new ways and here the chapter will inevitably start to become repetitious. The porcupine information architectures mentioned above can be part of an organisation's armoury for establishing the archive as an instrument of time-space distancing. In particular, there is a vast and largely untapped potential for organisations to establish recordkeeping informatics architectures built out of tailorable and modular applications designed with internalised nanosecond archiving processes in mind. One reason we are repeating this view, and will continue to repeat it in this chapter, is that the structuration of records involves the records continuum principle of inheritance. Across the dimensions of spacetime distancing, particular attributes established in one dimension can be inherited by another. An internet-based business application provides

the ideal mode for studying and applying this phenomenon, which has been largely ignored within the last thirty years of data-processing approaches to the application of our technologies.

From a recordkeeping informatics perspective, the time-space distancing dimension is the locus of an organisation's eagle-eyed view of business activities. From an archival vantage point, one can oversee the use of the record on the ground and imagine its use in different times and other spaces, particularly other spaces within the organisation. At least that was the case in the paper era, other than in organisations where the archive was regarded only as part of the old stuff. In such organisations a key change in perception is needed if the archive is to begin to mature into a robust twenty-first-century feature. The meaning of archive for this century can provide a point of stability. It is the body of recorded information constructed within an organisation by the actions of agents and instruments within business processes. It exists logically, even if physically its corporal nature might be hard to assemble.

The archive as a singular entity conceptually has copped a battering from its dominance by data-warehousing practices directed at establishing a single silo in a world of interconnections. Apart from a lack of attention to the archival issue of inheritance, the large silos of data have been flawed from at least two other crucial recordkeeping informatics perspectives. First, there is the kinetic problem of managing inscriptions connected to business processes while they are in motion, including their formation into activity bundles. Data governance is not enough. Second, big-data warehouses provide a very vulnerable place for the storage of electronic memory. Business records management applications need to cater for the growing range of choices for individual, group, and organisational stores, along with closely controlled and monitored cloud storage, including storage in public or private clouds perhaps using third-party facilitators. It is possible, of course, to look away from all this complexity, as many agencies are doing. If so, do not be surprised if your records end up on the front page of newspapers, in the hands of competitors or subjected to cyberwarfare and attacks.

Big-data and agile computing is, of course, not an either/or scenario. The archive can be built to share information, but that requires solid business analyses within internet-based business applications. At application level decisions can be made about what recorded information belongs in back-rooms, what should be public, what should be in the clouds, what data stores business tasks will need to draw upon, and so on. The archive can

be a container of the experiences contained within business applications providing an additional layer of security and involving intelligent decisions about the sharing of those experiences. In other words, the archive as a simple whole serving the purposes of time-space distancing can be based on the much greater complexity of its parts, a motif of this book, encompassing all manner of storage places, including data warehouses.

We are not saying the task of constructing a robust archive will be easy. In fact much of this book addresses the issue of how hard it is for an organisation to assemble its archive within electronic communication processes. The task, however, is beginning to become more manageable as a result of the emergence of new styles of computing that are more compatible with the goals of recordkeeping informatics. From an organisational business records management perspective, the archive can be designed with modularised quills of tailorable and replaceable business applications. With the help of archival agencies operating above them, organisations can participate in the process of identifying fractals, the patterns for applications that can be designed across organisations. Within the applications, connections can be made 'up' to the cognitive, social and technological aspects of informatics and 'down' to routines for records capture and the immediate contexts of action. Archival institutions can also get involved in designing, implementing, critiquing and approving the modules disseminating applications. Within their own boundaries and across them within partnerships, any organisation can be part of a network of agents exploring applications.

4.7 Records and Routines

In the 1990s, archivists expended a lot of energy defining a record, but from a structuration viewpoint it is a relatively futile pursuit. It has always been a complex word with many synonymous uses, but increasingly in cyberspace the word record, from an organisational perspective, needs to be defined by how it is formed in relation to business activities. It is more profitable to focus on describing its patterns of capture. Such descriptions are necessary because in digital recordkeeping there are ever-increasing ways of capturing a record of action and each way affects the reliability and use of the record.

At the simplest level of capture in electronic forms of recordkeeping, content can be recorded as it crosses a communication switch in a network. Intelligence agencies, for example, almost two decades ago began to set up

big-data systems that captured inscriptions such as an email as it crossed a router. Using the powers of modern technologies, the inscriptions collected in this way can be interrogated. More recently they have discovered this level of capture is greatly enhanced by accessing recordkeeping metadata about an individual's communications (see Chapter 8). The easiest point of access to such data is via the telecommunication industries metadata used in billing and, in Australia, this has developed into legislation directed at regulating what telecommunication metadata is captured, how long it needs to be kept, and government rights of access.¹² For business applications, recordkeeping metadata is more complex and our security agencies will undoubtedly learn that this is where the greatest amount of intelligence lies, as distinct from communication patterns that might or might not be red herrings. That is where there is a need to select particular relationships between agents, business processes and the inscriptions, but the schemes will vary from application to application. These business-based contingencies might need to be determined on a case- by-case basis, but as we keep pointing out patterns, will exist and, when identified, will simplify the analysis and can enable modules to be developed for tailoring in many other organisations or across them. As we mentioned above, we do not apologise for the repetition, because identifying recurrent patterns across different levels of spacetime distancing and implementing the continuum principle of inheritance are keys to managing an expanding continuum of recorded information. The search for patterns is an almost unknown pursuit in information systems design and development practices, but without them operating across the spacetime distancing dimensions, information will be increasingly unmanageable.

At its deepest level the capture of records has to manage both the fixity of the inscription and its fluidity over time, and, given the multiplicity of storage objects that can be applied to a single inscription capture of a record into different information spaces, has become one of the most complex forms of capture in the digital era. In the paper era the information space, more often than not, was a shelf. That is not to say the processes that preceded shelving in the paper era were also simple. In fact they could be quite complex, but the maturity of practices disguised this complexity.

12 The laws came into effect in October 2015, see Harry Tucker, 'New Data Retention Laws Begin Today, This is What You Need to Know', *News.com*, 13 October 2015. Available at <http://www.news.com.au/technology/online/new-data-retention-laws-begin-today-this-is-what-you-need-to-know/news-story/28ea2dc1b01d15e53f474e21b6d68501> (accessed 9 October 2016).

In the Australian Commonwealth government, for example, in the late 1950s mature registration systems based on the dominant organisation and methods approach of the era existed for business records management. Registration processes provided documents with a fixed identifier around which further action could be managed or connected, including moving them around the office as bundles, adding new inwards or outwards correspondence, or reconnecting them within new bundles. Within that approach administrative correspondence registries set up workflow patterns as the documents moved into, around, and out of organisations. In localised operating systems, items were likely to be registered within series based on the recurrent actions to which they were subject. About ten percent of records were said to be managed within a workflow-style administrative correspondence registry system that controlled documents as they entered or left the organisation. The other ninety percent were held in registration-based simple series set up and managed by the more specialised units in an organisation. Because of the ubiquitous presence of series of well-managed records, data useful for the linear processes of archiving could then be assembled at different points in the organisation according to action-based needs. Such organisations were truly Weberian bundles of activities held together by registration systems.¹³ At state government level at the time there were earlier models of this system and large registry systems for recurrent actions such as land titles, mining claims or births deaths and marriages.

One problem with such systems from a modern perspective was that they offered single point storage. The physicality of the record presented limited opportunities for rearranging files. Using internet-based business applications, that is no longer an issue, as multiple points of storage can be provided for the one inscription. Accordingly it should be possible to establish digitally based Weberian organisations in this century, but only if strategies like the pattern-based one recommended in this book were to become widespread. Adequate routines for appropriate levels of records capture based on forethought about the contingent complexity of particular activities can be in place before action occurs, but only within an application. That application itself becomes the means by which the massive diversity and the expanding transactionality of modern business processes can be worked through. The routines can take into account an array of inexpensive storage possibilities within and outside of the organisation, the need for security, the need to share information within and beyond

13 Maclean, 'Australian Experience in Records and Archives Management'.

organisational boundaries, or whatever exigencies and opportunities are thrown up within the application. The goal would be to design business architectures in ways that make inscription management a crucial part of business workflows, capture a performance for replay at a later date, enable objects to be bundled and rebound in multiple fashion with related transactions, and be advantageously moved on into new times and spaces.

Here the book develops a bad case of complexity. Technically everything in the above paragraph can be done, but, to understand what it means more fully and develop implementation methods, readers of this book will need to leave the book and try to apply them within thought based on analyses of the complexity of the parts. All that is offered in this chapter is the outline of a method for whole/part relationships in business records management. It cannot offer the experience of using that method, particularly in relation to cloud computing which at present is only a strong seedling. Archivists and records managers might have missed out on being part of the big-data evolutionary process, but there is still time to get involved with internet-based business applications and, from an organisational perspective, recordkeeping-based forms of business records management will always need to be built into such applications.

In considering the need to develop methods for uniting archiving and records management issues in the cause of nanosecond archiving and cloud computing, there is a sense of *déjà vu*. As we discussed in Chapter 2, a handful of postcustodial archivists began to envisage this sort of future in the 1990s and, in doing so, drew strength from the theorising of David Bearman, a systems analyst who tried to promote structured design techniques for nanosecond archiving.¹⁴ Unfortunately his proposed methods were based on design paradigms for recordkeeping systems that were too cumbersome for implementation. He imagined a recordkeeping floor sitting under an organisation's activities, which gave universality to the system's electronic recordkeeping routines and forced archivists to try to produce single definitions of a record to describe what would go under the floorboards. Bearman's method matched the leviathan-like and programming-dependent application platform interfaces of the times. We are offering something different in this book. Rather than follow up on mature ISD techniques that might be in decline by the time they are seized upon, we are following a less well-known element of Bearman's theorising, the

14 David Bearman, *Electronic Evidence: Strategies for Managing Records in Contemporary Organizations* (Pittsburgh: Archives and Museum Informatics, 1994).

use of internet-based business applications to pursue routinisation goals more selectively. In doing so recordkeeping informatics can further the emergence of agile computing and help define its nature. For example, the routines can help us get beyond the very dangerous levels of insecure storage of electronic memory discussed in the next chapter by creating modular forms of protection.

In another element to this chapter that is about to become repetitious, the great advantage recordkeeping informatics-based routines will have is that they cannot tolerate the absurdity of the division between information management and information systems design in modern disciplinary constructs. The Records Management Association of Australia, for example, now calls itself the Records and Information Management Professionals Association (RIMPA), which sounds like it offers a broadening of approach, but in practice reflects a narrowing of the business records management role. It follows a long period of financial and intellectual wooing from the information management-driven digitisation industry. Ironically, the most noticeable contributions of Australia to records management in the last half of the twentieth century related to records and archival systems design (ISD), but they did not call themselves RISDPA. This book comes out of both a recordkeeping systems design tradition and records-based approach to information management within business processes. These traditions in Australia have never recognised the dominance of the product approaches to information management of the paper era, but are in this book now challenging their own process based ideas about the need for a universal recordkeeping floor based systems approach and shifting to more nimble methods for both production and process.

The simple singularity of the information objects as a record which is at the heart of the connections with information management has been well and truly disrupted by ICT changes of the last thirty years, but within applications one can focus on complexity management. Routines for managing information objects as they cascade through spacetime can be built in accordance with the detailed treatment of the part. Information management does not disappear. Rather it becomes part of the nanosecond archiving processes within considerations of more adequate granulated control over access, respect for the information management regulations, including copyright and privacy rules in particular times and places, digitisation requirements, if there are any, and the storage of information objects in multiple spaces in different forms across multiple times.

That marriage of systems management and information management within routines for records capture needs to be carried up into the formation of the archive and down into the analysis of business activities within what in this book we call the flicker – that present moment in sociology or recordkeeping where the past meets the future and changes both of them.

4.8 Inscriptions and Protocols Using Inheritances from Situated Contexts

The reason the structuration of records and, therefore, recordkeeping informatics cannot tolerate the disciplinary division between information management and information systems design and development is that, like any social patterning of behaviour, it has its origins in moments of interaction. These are precise moments in time that in structuration theory are kinetic. In digital recordkeeping, if you manage objects as end products of that interaction you will be sweeping up after systems decisions have already been made about the spacetime distancing potential of objects. Information management and systems design have to manage the rippling out from the interaction and are also shaped by the inward pressure of existing social, organisational, group and individual protocols. Each inscription in recordkeeping informatics will be subject to the duality of structure and action and of the joint operation of information management and information systems design and development practices.

We have called these moments of interaction-situated contexts, rather than simply context, because context is never fully knowable no matter what recordkeeping metadata about it is recorded. The situated contexts of transactions can be imagined in ideal form as being at the centre of a Russian doll where characteristics are inherited from the small doll to the dolls that contain it. The three outer layers of structuration in recordkeeping informatics encompass the purposive application of the cognitive, social and technical elements of informatics, the functions of the archive as a tool for time-space distancing, and routines for action. The outer layers regulate the inner recordkeeping actions by providing the rules by which they operate. The rules also provide the sort of resources needed to undertake them. In other words, although Giddens does not use the word used in diplomatic science, they provide protocols. Actions have consequences and as they move out from the moments of action and create new moments of interaction they can disturb or confirm protocols. During the transition

from a paper era to a digital one, the mediative force of protocol development has been lagging a long way behind the transformative changes.

From a recordkeeping viewpoint the significance of the word protocol has a long history. A protocol was initially a sheet pasted to a document guiding ways into the content of that document. As such it was specific to its situated context, but opened up spacetime distancing perspectives, a standard characteristic of any protocol. Internet protocols, for example, have become a classic example of spacetime distancing powers. The focus in this book is on organisational protocols and all organisations must develop their own internal protocols for managing spacetime distancing if they are to meet the normal expectations of interested parties, be they those of shareholders in a commercial venture, taxpayers in a publicly funded activity, or citizens.

For the purposes of this chapter those undeveloped protocols relating to nanosecond archiving were encompassed by the formula P_R_A_A. In the dimension of the immediate contexts of interaction [P], the recursive points of action in sociology, and recordkeeping informatics, informatics protocols need to address the issue of the inheritance of characteristics that help manage recorded information across spacetime. Historically the form of a document has been crucial to this approach and was the locus of archival studies in diplomatic science. Legal and archival documents were often much the same thing and European black letter law judicial systems along with juridical codes of behaviour and archival systems grew out of an emphasis upon documentary form. The ubiquitous form is still present in many aspects of life and is a regular component of internet-based business applications, but the expansion in the continuum of recorded information throws its design into flux. New routines in which form-based inscriptions can be inserted need to be developed.

The whole, the organisational archive, is expanding, but the old linear rules for organising it have collapsed. In the paper era, routines and timespace distancing techniques for archival formation had centuries within which to mature, and, as we have seen in relation to accounting systems, that maturation took place within hypertext networks. What was regarded as best practice was imitated, redeveloped, and passed on from agent to agent via networks of professionals, consultants, or suppliers. In our age of an expanding continuum of recorded information, there is a survival-based social need to condense centuries of evolution into a few decades. If organisations want to take advantage of the evolution and be

involved in it, they should participate in the hypertext network needed for protocol establishment, unless in irresponsible fashion they simply want to profit from the chaos. They need to devote much more attention to protocols for modular and tailorable recordkeeping architectures that take into account the need for open-source software and look to the spacetime distancing task of establishing backward and forward compatibility within the management of inscriptions and data about them.

In summary, from an organisation's viewpoint, protocols that can be applied at the moments of interaction are important to their life-chances, their mutually beneficial associations with others, and the spacetime management of their business activities. Rules, as Giddens argues, are resources. Protocols for never-ending story management and the governance of the ongoing process for moving inscriptions into new bundles will matter to ongoing business processes of any organisation. So too will management of an array of information stores (not just stores in the clouds) and the identification of inheritance-based patterns (fractals) that can be used within information-based enterprise architectures that provide direct platforms for business activities. They also have to meet the requirements and demands of legal systems (very much in flux) and external watchdogs and monitoring agencies (very much an expanding force in lieu of stable legal systems). In diplomatic science the juridical traditions of archival and legal systems complement each other. When the legal system faces massive readjustment, as they do in relation to the dissemination of recorded information, more weight than ever falls onto behavioural codes for the formation of the archive. It is in flux, but the protocols for its nature and constitution can be adjusted, controlled and managed more quickly than judicial systems helping to explain the emphasis upon the approval for, and auditing of, internet-based business applications in this book.

The dissemination of records provides the clearest sign of just how widespread the impacts of the collapse of protocols from the paper era have been. These will be discussed in the next chapter, which we hope will help the reader appreciate just how significant the collapse of recordkeeping protocols has been. Anyone who thinks they have immediate solutions to the development of new judicial systems for the formation of archives has no grasp of the depth of the complexities involved in managing and controlling nanosecond archiving. Ultimately, how quickly adequate business protocols involving digital recordkeeping emerge will depend upon the impact of new relationships between structures and actions and on the success of informatics professionals in developing a never-ending

global and hypertext-style network involving techniques and codes of behaviour for managing cascading inscriptions using information inherited from situated contexts of interaction. Part of that development will be to continue to demonstrate that spacetime distancing is a core classificatory component within information management and information systems design and development, and that it is a key to adequate business records management.

ACCESS: THE BREAKDOWN OF DISSEMINATION

5.1 Dreams and Nightmares about Nanosecond Archiving

Access, and the entwined issues represented in the knot of complexity that is access, is one of the most dynamic facets through which to explore recordkeeping informatics. As our focus is on authoritative resource management, in this chapter we will discuss the current collapse of an authoritative approach to dissemination and in the next chapter will look at how the major planks of archival functionality (storage, appraisal, and provenance) can be reinvented.

Modern problems with access to records illustrate two of the major themes in this book. The first is the expansion of the continuum of recorded information. Collective memory, according to some writers, is being replaced by connective memory.¹ Described by William Mirren as ‘me-dia’, this connective memory is the ‘realm of horizontal, peer-to-peer, mediated interpersonal communication’.² Opinions may vary as to whether that is a replacement or a technological perspective on how collective memory has always been forming, but what is less open to debate is that the growing array of apparatus for social interaction has expanded exponentially along with their use in social communications, spawning the social media phenomenon.

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- 1 Anthony Hoskins, ‘7/7 and Connective Memory: Interactional Trajectories of Remembering in Post-Scarcity Culture’, *Memory Studies* 4.3 (2011): 269–280.
 - 2 William Mirren, ‘Understanding Me-dia: The Second Reformation’, post on Media Studies 2.0 blog, 6 March 2010. Available at <http://mediastudies2point0.blogspot.com.au/2010/03/understanding-me-dia-second-reformation.html> (accessed 10 October 2016).

The second theme (discussed in detail in Chapter 4 on business processes) that connects closely to access problems is that we need to think in advance of document creation in ways that lead to forming a reliable record of action worth accessing that is also part of a useful and usable archive. The goal is nanosecond archiving based on the adequate capture of records, an approach we will describe in the last part of this chapter as postcustodial archiving. The concepts of time and place in memory formation are being challenged in this connected world in which the current moment drags attention away from its connection to past and future moments. The seemingly infinite expansion of memory storage is enabling a more dynamic form of memory able to be stored, seemingly neutrally, for recollection and recreation during sense-making processes at any and many times in the future, but its potential for this is not being adequately harnessed. Nanosecond archiving is a modern reality. It is not its existence that is in question in this book, only its quality.

Together these themes of expanding quantity and declining quality of recorded information provide a rationale for our emphasis on the expansion, chaos, and diversity of information resources and technologies. In the chaotic, transitional, and intrinsically complex environment that we all face in the early years of the truly digital age, institutions, organisations, business models and disciplines are all struggling to comprehend the impacts of the transition on their operations. Commonly referenced as the digital deluge, the transition is a phenomenon changing the fabric of operating in the world. We will argue that it is more than a deluge of content. In relation to access to records or our actions, it is a rhizome spreading as ground cover over all human activity.

There is no doubt that what we are watching in the realm of access to information in the internet environment is an aspect of a long chain of complex negotiation on what exactly access to information means. As we move further into the pervasively connected world, the norms are shifting, boundaries are being pushed out, negotiated back, disputed, and our concepts of what we mean by access to information and what is acceptable are in flux. As these themes work themselves out in our examination of access, we might seem to be setting up a complex diagnosis beyond implementation. If so, it probably will have little effect on the thinking of cyber-Utopians who advocate the virtues of information sharing. To them, access to information is not in disarray, and in part they are right. In terms of allocative resource management we have entered into an era of unprecedented retrieval power. Access in that sense has never been easier. Our technologies have opened up

new ways of finding information beyond past imaginings and our goal is certainly not to un-imagine such advances.

Cyber-Utopians, however, can make access to information sound so easy. It is what everyone wants ... or do they? 'Information wants to be free'³ is the internet mantra from the 1980s and the social, organisational and personal implications of this mantra are still being worked through, most prominently through social media technologies and the open data movement. But even here there is ambiguity – does 'being free' refer simply to availability, or availability without cost? How do information security concerns clash with the desire of information to be free?

In very real senses the vast technical advances being made in the area of retrieval of information means information can indeed be free. However, authoritative resource management throws all manner of questions around this freedom, in particular relating to the new disorder in the dissemination of recorded information about actions and the threat cloud computing offers to deepen the disruption of traditional organisational control over the storage of records. What should be happening to information governance within a culture of information abundance? Surely it has got to involve something more sophisticated than deploying firewalls and engaging in knee-jerk prosecutions of those trying to liberate information.

The chapter begins by considering collapsing juridical frameworks for archival access, which provides the foundation for more detailed discussions of access restrictions and permissions, confusion over the role of Freedom of Information (FOI) codes of practice, the unexpected consequences of big and open data, and the world where information sharing includes leaking from and hacking into vast swathes of action-based records. In the final section of this chapter we will argue that, if things seem bad on the authoritative

3 Attributed to Stewart Brand at the first Hackers Conference in 1984: 'On the one hand information wants to be expensive, because it's so valuable. The right information in the right place just changes your life. On the other hand, information wants to be free, because the cost of getting it out is getting lower and lower all the time. So you have these two fighting against each other' ('Information Wants to Be Free', *Wikipedia*, http://en.wikipedia.org/wiki/Information_wants_to_be_free (accessed 10 October 2016). Subsequently, in 1987 he wrote, 'Information Wants To Be Free. Information also wants to be expensive. Information wants to be free because it has become so cheap to distribute, copy, and recombine – too cheap to meter. It wants to be expensive because it can be immeasurably valuable to the recipient. That tension will not go away. It leads to endless wrenching debate about price, copyright, "intellectual property", the moral rightness of casual distribution, because each round of new devices makes the tension worse, not better.' (Stewart Brand, *The Media Lab: Inventing the Future at MIT* (Viking/Penguin, 1987), 202.

access regulation front at present, they will probably get worse before they get better as a result of cloud computing and the ongoing collapse of organisational custodial control of archives. Throughout the chapter, reference is made to real-life examples of chaotic and complex access issues. New instances are constantly emerging, to the extent that this chapter could be in a process of continual revision to reflect current headline-making issues relating to access. In order to avoid falling into that trap we decided to retain examples that were in the news when this chapter was first drafted. We are certain that readers will be able to replace these situations with more topical ones whenever this chapter is read, such is our pessimism about the broken state of access. However, our exploration of cloud computing in the following chapter takes a more optimistic perspective, looking at the revival of archival functionality within our dream of a postcustodial world built on quality approaches to nanosecond archiving.

5.2 The Juridical Base to Access

At the core of any authoritative resource management-based discussions of dissemination of records in recordkeeping informatics will be the old-fashioned notion that, contrary to the drive to share ‘information’ in general, some information relating to actions needs to be protected for a variety of reasons and for a variety of periods of time – that is, not everybody can see everything, at least not directly. Society can, however, have trusted agents that can open up access, including ombudsmen, other watchdog agencies and courts of law. Generally, the need to apply restrictions and associated permissions for access diminishes with time, but it is a complex area requiring considerations at social, cultural and organisational levels which need to be based on understandings of the governance of business processes and the human rights that should be respected within our mutual associations. It is not an area that should be left to amateurs.

Jurisdictional rules generally apply to the requirements to either open or protect records, certainly in the government sphere, but also increasingly in the form of requirements to protect personal data applicable to all organisations. The jurisdictional level is also the sphere where contradictory or overlapping requirements make negotiating the responsibilities on organisations difficult to reconcile. Jurisdictional rules are found in:

- public records (or archives) legislation which usually provides rules about public access to government records after the passage of an appropriate length of time,

- freedom of information or right to information legislation which establishes the principles on which access to current government records can be requested, subject to specified exemptions,
- personal data protection or privacy legislation, including health information legislation, which provides protections for personal information divulged for the purposes of doing any business and applies to all organisations,
- open access directions, either through open government statements encouraging government organisations to publish their data for public reuse, or through funding arrangements with research bodies,
- records and information management standards, including those relating to information security enforcement within computing networks. Industry best practice, such as the ISO 27000 series of standards, can be translated into jurisdiction-specific guidance, typically covering technology, personnel, physical storage and other factors. Dovetailing requirements to achieve consistency rather than competition between information professionals in implementing information security provisions is desirable.

The provisions of these disparate pieces of legislation, standards, or mandates do not always work well together, and, furthermore, differences between jurisdictions result in a complex patchwork of overlapping and non-standardised requirements to be negotiated.

This patchwork is now being overlaid with the idea of a global jurisdiction, in which juridical requirements are beginning to be universalised. Given the way corruption is proving to be such a successful world game, this cannot happen quickly enough. However, the move to global juridical arrangements is being handicapped by the problems involved in the way internet technologies are disrupting existing arrangements and precipitating an era of ongoing internet wars. While the stated intention of most governments is to promote tools of governance as a means of improving accountability and transparency, the practice of this intention is at present the scene of significant international and social concern and dissent. In relation to the dissemination of information about people and their actions, chaos is expanding, as our discussions of access restrictions and permissions, FOI legislation, big data, the leaking of information, and hacking will show.

5.3 Restrictions/Permissions

Determining who should be able to access what information in organisational contexts can be regarded as a question of matching a matrix of requirements relating to the business (what is being done), the records (the reflection of what is being done), and the agents (who can see what). This matrix requires resolution of at least three separately applied access restriction principles.

The first principle is that the default position is openness. The storage of electronic memory is so dramatically insecure anyway, and social media is an increasingly powerful weapon against non-transparent organisational behaviour. However, whether openness is appropriate in all cultural contexts is debatable. Even when openness is seen as necessary and desirable, there will always be some business processes that legitimately require greater security than electronic memory storage is currently providing and improvements in this area are needed. In some cases, even knowing that there are records about certain matters can be sufficient to encourage breaches of security, and in these cases access to the metadata about records should be restricted to authorised individuals. Restrictions specifically applied to records include allocation of jurisdiction standards for security classification – such as restricted, confidential, or different levels of secrecy. Better methods for protecting information will not come from blunt instruments like firewalls. Improvements will come from more adequate work-process analysis undertaken to determine appropriate recordkeeping controls, including determining access restrictions and other techniques, that enable business rules to be defined and applied consistently throughout the organisation.

Second, access restrictions normally only apply for a limited period. Mechanisms to lift access restrictions after a period of time or after trigger events (such as lifting an embargo on access until after formal announcement) need to be applied. Failure to automate the lifting of access restrictions has exacerbated problems arising from excessively conservative decisions and can result in records maintaining their security ranking far beyond the time needed for any business requirement. This can create the situation where a costly additional process is needed to lift restrictions well after the business has been completed. Consequences of such additional processes can be seen in the US government administration. The Obama administration came to power in the US with an ‘Agenda for Change’ which included attention to the process of declassification of information to make the system ‘routine, efficient and cost-effective’. The scale of the problem, identified by

the Information Security Oversight Office, reported that ‘Federal agencies are facing a massive volume (1.7 billion pages) of classified textual records that, based on 2008 review statistics, will take over 33 years to complete an initial review, and many more to complete referral reviews and process all the records for public access’.⁴ The costs for managing the information security regime in 2011 were reported to be US\$11.36 billion.⁵ Applying a retrospective, document-by-document analysis to lifting security classifications is clearly not a cheap process, and, given that it can be seen to not contribute to the ‘bottom line’, avoiding such costs is likely to be the norm.

Third, people have to be explicitly assigned permissions to see material that has been allocated access restrictions. This can be a formal process, where an external agency undertakes independent security checking and assigns a security rating to a person. Or within organisations, typically, permissions are assigned to roles undertaken and aligned with the need to access information in order to undertake activities. The goal of most organisations is to achieve single authentication that allows permissions to operate in particular business systems. This authority is role-based, and the problem with many of the systems implemented is that they are associated with an individual’s name, thus greatly increasing possibilities of inappropriate access as roles change within an organisation or, as increasingly is happening, access is granted to partners outside of the organisation. The protocols for network security typically used within organisations are not designed to retain historical information on roles or to cope with future shifts, but to enable current requirements to be met. Thus records systems usually needed to replicate (through inheritance) these network controls within the individual application to ensure that the tracking of permissions over time is possible. As records systems have declined in significance in our organisations and vast information sludge pits have increased in their usefulness, it has become harder and harder to ensure that access controls have the active monitoring that might ensure that leaks or attempts at unauthorised access are tracked and followed up.

We are not arguing that access control is particularly easy, but the lack of involvement from recordkeeping single minds exacerbates the problem. Obvious mistakes happen too often and they are sometimes then widely

4 *A Concept of Operations for a National Declassification Centre*, Revised: July 8, 2009, 4. Available at <https://www.fas.org/sgp/othergov/ndc-coo.pdf> (accessed 10 October 2016).

5 Information Security Oversight Office, *2011 Cost Report* (Washington DC: NARA, 2012). Available at <http://www.archives.gov/isoo/reports/2011-cost-report.pdf> (accessed 10 October 2016).

reported to the embarrassment of the organisation. In 2014 perhaps the most spectacular mistake was in providing access to masses of US intelligence information to outside contractors, such as Edward Snowden who downloaded the information and exposed massive discrepancies between pious policy statements and data collection realities. He, not the practitioners of governance by fiction, quickly became the villain in the government story, but he was not one of the espionage moles who, given the laxness of access control, will certainly have been feeding at the same information trough.⁶

Some mistakes are less monumental but, nonetheless, embarrassing. A case from the Ministry of Social Development in New Zealand highlighted the ease with which mistakes can be made. A member of the public was able 'to access thousands of sensitive files via a public computer kiosk using nothing more than an open file command in Microsoft Office and very basic computer skills raising concern that ... rogue staff could access thousands of personal files – which could then be sold.'⁷

Enforcing access and security restrictions is not simply a technological issue, but is influenced by information culture factors. Numerous examples of accidental breaches of security are reported routinely in the press, including leaving a highly confidential draft report on computers in a frequent flier lounge,⁸ and the loss of two CDs by Her Majesty's Customs and Revenue Department containing the personal details (bank details, addresses and phone numbers) of every United Kingdom family receiving child benefits.⁹ Even where strict processes exist for establishing rules on access restrictions

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- 6 Edward Snowden, a former US government contractor, fled from Hawaii to Hong Kong to Russia in a James Bond-style dramatic fashion after releasing loads of documents on surveillance in the US and around the world. The selection of documents was deliberate and thought out. In contrast to the WikiLeaks strategy, Snowden strategically leaked individual documents to 'old-media' print newspapers, primarily *The Guardian*. The leaks focused on documents from the National Security Agency (NSA).
 - 7 Chris Keall, 'MSD Failure Goes Far Beyond Kiosk Security Glitch – Expert', *National Business Review*, 15 October 2012. Available at <https://www.nbr.co.nz/article/msd-failure-goes-far-beyond-kiosk-security-glitch-expert-ck-130658> (accessed 10 October 2016).
 - 8 Cynthia Banham and David Humphries, 'Heads to Roll Over Lost Report', *Sydney Morning Herald*, 18 May 2006. Available at <http://www.smh.com.au/news/national/heads-to-roll-over-lost-report/2006/05/17/1147545393022.html> (accessed 10 October 2016).
 - 9 'HMRC Blunder Set to Cost at least £500m', 22 November 2007. <http://www.computing.co.uk/vnunet/news/2204125/hmrc-blunder-set-cost-least> (accessed December 2007).

to be implemented and you would reasonably expect recordkeeping minds to be present, some grotesque mistakes happen. A recent high profile case in Australia illustrates this; it involves an erroneous release in Queensland by the State Archives (QSA) at the behest of the Crime and Misconduct Commission (CMC). The culture of the state government involves relegating the archives to a very subordinate role in relation to the release or destruction of archives.¹⁰ When the CMC moved from granting access to material after sixty years to twenty years, many files were dutifully made available through the web, putting at least sixteen witnesses in a corruption enquiry at risk. If archival authorities are treated as cyphers they will behave like them, a problem that was exposed in Queensland many years ago when their state archivist was infamously used as a rubber stamp to authorise the destruction of records that would have contained evidence of the abuse of children, leaving the government open to lawsuits.¹¹

5.4 Freedom of Information Codes and Practices

Many jurisdictions have implemented FOI or right to information legislation that applies to government records. This type of legislation is intended to open up access to recent records of government, rather than requiring members of the public to wait until the elapse of any time period adopted by archival or other legislation. In doing so, as we mentioned in Chapter 1, in countries where archival legislation and a raft of domain specific legislation already exists, the fragmentation of access to records of action has increased, creating confused, contradictory, and irreconcilable access regimes.

Here we just want to focus on FOI legislation or codes, which have rarely lived up to the expectations of their drafters and advocates. In practice, information culture and the presumptions of the desirability of keeping records closed is a barrier to the effective implementation of the intent of such legislation. Information governance in Australia, particularly within the Commonwealth Government of Australia in relation to records of action, has become a one-sided emphasis upon information security.

10 'Qld Records "Stuff-Up" Threatens Fitzgerald Witnesses', *Image & Data Manager*, 13 March 2013. Available at <http://idm.net.au/article/009461-qld-records-stuff-threatens-fitzgerald-witnesses> (accessed 10 October 2016).

11 Chris Hurley, 'Shredding of the "Heiner Affair" Records: An Updating Summary'. Available at <http://www.descriptionguy.com/images/WEBSITE/records-and-the-public-interest-update.pdf> (accessed 10 October 2016).

Many factors contribute to the ineffectiveness of this legislation. One is the separation of decision-making from the normal business of the organisation, with the creation of a separate administrative unit, often within a legal area, for the consideration of requests for information under FOI legislation. FOI becomes a post-action mechanism divorced from business activities. The intent of such legislation is to presume openness and that the records/information are available, but the administrative structures result in the development of a culture of closure. At times this would be comical if the issue was not so damaging to the very notion of information governance. Redaction of records as a response to requests to open records, for example, can be taken to ludicrous extremes, even redacting all content with the exception of part of an email header. Such examples incur the wrath and ridicule of the external community, as can the requirements for technical redaction, which can obliterate the original meaning¹² or unintentionally expose details that should not have been exposed.¹³ Mistakes can happen, but they seem to be particularly likely to occur within cultures predisposed towards secrecy.

Another perceived problem is cost. Periodic reviews and submissions by organisations to such reviews continually stress the undue burdens and costs to organisations. Recent calculations by the higher education sector alone in the UK claim that:

Combining an average cost per request of £144.93 with the average number of requests per institution of 10.7 gives us an average cost per institution per annum of £18,609. Multiply this by the 163 HE institutions in the UK listed in HESA data and you arrive at a figure of £3,033,268 per annum.¹⁴

Most legislation allowed some costs to be charged to recoup expenditure on copying and to a limited degree for reasonable amounts of time spent specifically servicing such requests, but the intent was not to burden the requester with the problems an organisation may have because of their inefficient records systems and recordkeeping processes. A broad intent of

12 'CIA Realizes It's Been Using Black Highlighters All These Years', *The Onion* 41.48, 30 November 2005.

13 Grant Bryant and Fred Tulett, 'Police Blunder Unmasks Secret Files', *Stuff.co.nz*, 21 February 2013. Available at <http://www.stuff.co.nz/national/crime/8331505/Police-blunder-unmasks-secret-files> (accessed 10 October 2016).

14 Steve Bailey, 'Ever Wondered How Much Freedom Of Information Costs the Sector?', post on JISC blog, 4 March 2013. Available at <https://www.jisc.ac.uk/blog/ever-wondered-how-much-freedom-of-information-costs-the-sector-04-mar-2013> (accessed 10 October 2016).

such legislation was to provide incentives for organisations to improve their recordkeeping systems and their capacity to identify and provide documents on request, but the challenges involved in doing this in the light of the massive expansion in the amount of recorded information to deal with, coupled with the declining emphasis upon records systems, have proved too great.

Within Australia a second wave of reform of the FOI regimes has been necessitated by the almost complete negation of the intent of the original legislation, but so far the wave has not caught up with the change in focus from a single inscription to a cascade of them within an ever-expanding continuum of recorded information. In a review of the current legislation, it was noticeable that agencies reported an increase in requests for access to non-personal information seemingly imposing undue burdens on bureaucracy! As an indicative example, the submission from the Department of Foreign Affairs and Trade to the 2013 review of the Commonwealth of Australia's legislation stated:

Since 2009–2010, the cost of FOI to Government has increased by 51.8%. ... That is, if the Government has invested 50% more resources into FOI through the reforms, it could expect to see at least a 50% increase in the value being derived for the community from FOI.¹⁵

Given the malformation of modern archives, it is hardly any surprise that in a world of massive information expansion access mechanisms to documents are costly. Cost minimisation takes us back to the basics – the way we capture records and form archives within information cultures that respect their records and welcome information sharing. To take an elementary example, many FOI requests have involved access to personal records that surely shouldn't need legislative imperative. However, there is some evidence of alternative approaches – in Seoul, for example, where new codes are being developed which focus on government information resources that support the life-chances of the citizenry.¹⁶ We need proactive approaches to authoritative resource management that open up cascading information

15 Department of Foreign Affairs and Trade, 'Review of the *Freedom Of Information Act* 1982 (FOI Act) DFAT submission' Submission to Hawke review of FOI, 2012, 3. Available at <https://www.ag.gov.au/Consultations/Documents/ReviewofFOI/Department%20of%20Foreign%20Affairs%20and%20Trade.pdf> (accessed 10 October 2016).

16 Sangmin Lee, 'Information Access in the Public Sector in Korea', Paper presented at the 4th International Conference on Electronic Records Management and Technology, New Taipei City, December 2014. Available at <http://wiki.archives.gov.tw/images/stories/1031222/09.pdf> (accessed 10 October 2016).

resources, but to achieve that quickly and at low cost our nanosecond archives will have to be more intelligently formed.

Fundamentally, access to recorded information about what has happened or is happening is influenced by information culture dimensions. In Australia many policy and procedural changes are needed. These include providing for the better dissemination of replies to requests. Advocates for access have been increasingly frustrated by government departments, perhaps naively, making material available in ways that make it difficult to reuse, for example, by publishing answers to requests in static, locked PDF documents. More adequate forms of access must, of course, include reforming information practices, a general area of failure in the Commonwealth Government of Australia as a result of separating dissemination issues from the role of their information specialists, such as records managers, and failing to promote a recordkeeping single mind across all business activities, including outsourced ones.

The recordkeeping single mind could have been paying attention to some very basic dissemination issues. For example, under the recent round of reforms to the access legislative agenda in Australia, the routine publication of 'disclosure' logs is required – a statement of what has been released and access to the information itself (with certain exemptions). Once this information is opened to access under this legislation, it makes absolutely no sense to then consider it 'closed' within the organisational systems and to put it back under the normal time-based access rules. Open is open. The fragmentation of responsibilities for systems managing these processes means that these decisions are not being translated back into systems in motion.

Any modern access agenda should also encourage third-party service providers to broker greater access to information. Such providers have begun to appear, with one example being the Australian Right to Know website.¹⁷ From a cultural viewpoint, the response of the government departments to such third-party services is quite telling. One would think that they would be embraced in the spirit of greater access, but they appear to be perceived as a threat to departmental authority, a far more defensive reaction than one can reasonably expect from organisations that should be keeping their records on behalf of the people, not merely themselves. Is this why the implementation of FOI seems so expensive? Have its costs been removed from the budget for designing and implementing systems in the first place? And to what extent do the inadequacies of those systems compound the later expense?

17 www.righttoknow.org.au.

5.5 Data – Big, Raw, and Often Open Beyond Expectations

‘Raw data now’ was the chant led by Sir Tim Berners-Lee at the close of his address to TED2009, the 25th anniversary conference on technology, education and design. It reflected his advocacy and that of Professor Nigel Shadbolt of open data following the influential *Power of Information* report published in 2007. That report made the case that government data can be part of the opportunities that are emerging in terms of the creation, consumption and reuse of information. Current policy and action was not yet adequate to grasp these opportunities. To this end, the report recommended a strategy in which government:

- welcomes and engages with users and operators of user-generated sites in pursuit of common social and economic objectives;
- supplies innovators that are reusing government-held information with the information they need, when they need it, in a way that maximises the long-term benefits for all citizens; and
- protects the public interest by preparing citizens for a world of plentiful (and sometimes unreliable) information, and helps excluded groups to take advantage of access to data.¹⁸

Public sector information (PSI) and the trend to release government data can be an economic driver in building new industries and businesses for the digital economy. The rationale governing PSI initiatives is that taxpayer’s money has already been expended in creating and gathering such data, and that this should now be made freely available for public reuse.

Worldwide, governments are adopting this strategy, and ‘data.gov.xx’ sites are available in many countries and have almost become a false litmus test for national interest in e-government. We say false because it is an example of successfully using the productive powers of the technology, but there is much more to authoritative information e-governance than this. Even within this highly desirable trend to openness, there is rather more to publishing government data than simply throwing them up on a website. The format of the data is important – machine-readable not human-readable formats, underived, raw data not textual analysis, and so on. Metadata about the data – its syntax and semantics – is critical to

18 Ed Mayo and Tom Steinberg, *The Power of Information: An Independent Review* (London, 2007), 4. Available at <http://www.opsi.gov.uk/advice/poi/power-of-information-review.pdf> (accessed 10 October 2016).

understanding and contextualising the data and how it is derived is important for its interpretation. Establishing rights, if any, in the data is critical to its effective and responsible reuse. All too often the race to 'publish' data results in yet another stream of responsibility being established for this activity – unconnected to any of the existing information management practices and responsibilities in organisations. The framework for open data needs to be thought through in organisations – the relationship to other information resources, responsibilities for maintaining the data up to date or ensuring the appropriate dating information is detailed, metadata supporting resources, linking to explanations about what produced the data, and thought about how long the data is reliable for. What will happen to the data when it is no longer the latest, or is replaced? Is this a resource that needs to be managed as part of the ongoing records base of the organisation?

Accompanying the open-data movement is a related set of initiatives to remove restrictive copyright on data and records. The Creative Commons movement seeks to create licenses for data more appropriate for data sharing and reuse. Various governments and other agencies have developed their own or modified some of the standard Creative Commons licenses to encourage such reuse. Again, while this may be advocated as part of open government and increased transparency reforms, getting organisations to agree to abide by these newer types of licensing is more of a cultural change, which has yet to penetrate far into bureaucracies. There, as with the FOI and other openness initiatives, the fear and blame game where mistakes are embarrassingly shouted from front pages of newspapers with glee creates environments where it is very difficult to encourage initiatives for openness. Individuals fear they will be held personally responsible for mistakes. As data is reused and recomposed into new products and different structures, tracing licenses and ownership of data is likely to become far more complex. As we move into the increasingly componentised world, persistent metadata associated with licensing rights but also ensuring the authority of the information is needed. Innovative work is beginning in this area, with projects like the Commonwealth Scientific and Industrial Research Organisation *Spatial Identifier Reference Framework (SIRF)*.¹⁹

19 Paul Box, Rob Atkinson, David Lemon and Lauri Kostanski, 'Exploiting the UNSDI Spatial Identifier Reference Framework in Australia: Innovation and Policy Implementation', CeBIT presentation, CSIRO Digital Productivity and Services Flagship, 29 November 2012. Available at <http://www.slideshare.net/sirf13/2012-1121-spatialatgovsirfboxfinal2> (accessed 10 October 2016).

The academic community, and most clearly the scientific academic community, has been sharing disciplinary data in creative ways for many years. They have done this on a discipline-by-discipline basis, funded by community collaborative initiatives, which again are totally admirable. One of the most successful examples is the World Meteorological Organization's World Weather Watch.²⁰ While such initiatives are institutionalised and securely funded, many smaller disciplinary groups operate in fragmented and ad hoc ways based on the goodwill of their members. Some broader thinking about how to support such initiatives outside the governmental frameworks is needed.

Where governments fund research, funding bodies are increasingly requiring that the data supporting funded research be openly available as a condition of funding. Such requirements are part of the funding requirements for organisations such as the Australian National Health and Research Medical Council (NHMRC) and the requirements are spreading out into all disciplines. While mainly impacting the higher education community at this stage, reactions to managing this research data are interesting and instructive as another example of how new requirements spur the growth of new silos of interest unconnected with larger information frameworks in organisations. So research data management is now often the province of academic libraries and in that community a great deal of work is being done to identify basic sustainable management of such resources.

Some of this is not without backlash however. Some academics are very protective of data supporting their research and resist making it available. Compromises, such as a twelve-month period to ensure that additional and follow-up publication from research results, are commonly introduced as a response. Publishers too can be highly resistant to the academic community's call for greater openness of their research products. Academics argue that, while publishing their results in peer-reviewed journals is a critical component of their research impact assessment and academic processes, in fact they write, peer-review and consume the products of the journals. Publishers are the middlemen and, in the digital world, the requirement for the middlemen is being questioned, particularly when the model for

20 Modern meteorology depends upon near instantaneous exchange of weather information across the globe. World Weather Watch, established in 1963, combines observing systems, telecommunication facilities, and data-processing and forecasting centres operated by WMO members to make available meteorological and environmental information needed for efficient forecasting in all countries; see http://www.wmo.int/pages/prog/www/index_en.html.

consumption of the output is subscription- based, at exorbitant costs borne by institutional libraries in times of budgetary constraint. When subscriptions are cancelled, so too is access to the publications previously obtained by that subscription. Similar outrage is being felt by individual consumers of e-books, where it seems the reader can pay for e-books (at nearly the same price as the hard copy book) to find it available only in proprietary formats with no migration paths, leading to the gradual understanding that in this model individuals do not own the books they have paid for but only lease them! The business models for making money in the digital world out of information are clearly not settled.

Big data has come under some scrutiny with Gartner²¹ suggesting that big-data analytics is a solution looking for a problem, best suited to detailed customer analysis supporting information accumulated through radio frequency identification (RFID) technologies in the retail sector.²² Keeping everything in case we can deploy analysis for some yet unspecified business purpose is a boon to the storage industry. But we know from previous unsuccessful data-warehousing efforts that uncontextualised information drawn from disparate systems without adequate traceability is not trusted in making business decisions. Even the science community, where digital data is automatically collected from a variety of ongoing sensors or other automated sources, has begun to question whether everything is needed forever.²³ Untrammelled retention of everything is clearly not the answer. Yet, in the face of what seems like diverse drivers for over-retention, someone might find it useful to develop new methods for cost-benefit analysis that might interrupt for a moment the hand-rubbing glee of the storage industry as the trend towards big data expands. In this volatile digital world cost-effectiveness and storage should be kept under constant review against authoritative information resource management needs. The most telling example of this is perhaps the value of the analogue 'back-list' of audio and film once regarded as too costly to maintain and disposable by recording companies and studios, and now, in the age of internet-enabled streaming content, once again a major corporate asset.

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- 21 Gartner, Inc. is an information technology research and advisory company with its headquarters in Stamford, Connecticut, USA, and with associates in many countries.
 - 22 Sophie Curtis, 'Big Data is a Solution Looking for a Problem', CIO from IDG, 14 February 2013. Available at http://www.cio.com/article/728854/Big_Data_is_a_Solution_Looking_for_a_Problem?taxonomyId=600010 (accessed 10 October 2016).
 - 23 Todd A. Carpenter, 'Does All Science Need to be Preserved? Do We Need to Save Every Last Data Point?', post on *The Scholarly Kitchen* blog, 18 October 2012. Available at <http://scholarlykitchen.sspnet.org/2012/10/18/does-all-science-need-to-be-preserved-do-we-need-to-save-every-last-data-point> (accessed 10 October 2016).

5.6 Leaks and hacks

Much of the framework for different ways of disseminating records and information in the digital world is still being developed. Engaged, often youthful, communities, which are digitally involved in ways that are outside the norms brought to bear by the ‘management men’, are changing the landscape. Different expectations and learning new ways of accessing information while balancing the requirements for continuity and stability will make the digital information space a dynamic and engaging place to explore within recordkeeping informatics.

The most spectacular change in the dissemination of recorded information in recent years has been a quantitative rather than qualitative one. WikiLeaks provides a prime example of this. The leaking of information is an area that has always had different views and multiple perspectives. Politicians, for example, complain of leaks, but have a long history as providers of leaks. Indeed the business of leaking has been a method of governments (for political reasons) and citizens (to hold governments to account) for many years now, but the advent of electronic memory stores has changed the dimensions of the problem by massively expanding the amount of material that can bypass the normal control and attribution of information.²⁴ Greg Terrill has identified four types of leak: ‘the venal, the ideological, the whistle-blowing, and the trial balloon’. The area that raises the newest ethical issues is the whistle-blowing drive. Many governments have passed legislation nominally providing protection to whistle-blowers who are broadly considered to undertake an act of conscience where their concern about social needs overrides their specific duties to their employer. At the same time, governments, under the guise of information governance, are strengthening their secrecy mechanisms. Rather than information governance, their goal is to control their own information, deciding for themselves what is in the public interest. Whistle-blowers almost always pay a very severe price for their conscientious actions, as the case of Chelsea Manning vividly demonstrates.

By engaging in global, distributed, unmediated, but organised, crowd-sourced and quintessentially digital dissemination processes, WikiLeaks brings together a number of strands relating to access. Suddenly records – information about situated action – are front-page news. That a ‘society’ cares

24 Greg Terrill, ‘Chapter 11. The Ship of State and It Leaks’, in *Secrecy and Openness: The Federal Government from Menzies to Whitlam and Beyond* (Melbourne: Melbourne University Press, 2000).

deeply about records is no longer in doubt. The role of the media is challenged in the assertion that WikiLeaks is itself a mass media organisation and its key developer, Julian Assange, is a journalist. His later collaborations with 'old media', such as newspapers make for interesting generational and power-based assessments of his role from many perspectives.²⁵

But WikiLeaks is also an exemplar of an ideological leak, and idealists or data evangelists are an identifiable part of the internet. Apart from Snowden and Assange, another is Aaron Swartz, not only an evangelist and advocate of open access,²⁶ but also perhaps a martyr to the internet openness cause. In 2008 Swartz famously downloaded and released about 2.7 million federal court documents stored in the Public Access to Court Electronic Records (PACER) database managed by the Administrative Office of the United States Courts and made them available outside the expensive pay-for-access service provided. An acknowledged internet guru and activist, Swartz also downloaded 4.8 million academic articles from the online service of the Massachusetts Institute of Technology drawing on their digital library (JSTOR). The articles were returned to JSTOR with no further distribution, but the case created criminal indictments from MIT and the federal government (not from JSTOR), which carried the potential of thirty-five years in prison and million dollar fines. Swartz committed suicide in early 2013 before these charges could be prosecuted. JSTOR has taken action to upgrade the security problems that had been exposed by Swartz. Whether the prosecution directly led to the suicide is a matter of speculation, but the scale of the legal reaction and the anomaly of the scale of penalties imposed on someone pointing out systemic access weaknesses show a suppression mentality at work in the face of the maxim that 'data wants to be free'.

Changing forms of memory storage, communication devices, social and cultural dynamics, and the sophistication of data literacy amongst activists are all providing challenges for organisations. If the number of people

25 For an exploration of some of the access issues relevant to WikiLeaks, see Frank Upward, Sue McKemmish and Barbara Reed, 'Archivists and Changing Social and Information Spaces: A Continuum Approach to Recordkeeping and Archiving in Online Cultures', *Archivaria* 72 (2011): 197–227.

26 'We need to take information, wherever it is stored, make our copies and share them with the world. We need to take stuff that's out of copyright and add it to the archive. We need to buy secret databases and put them on the Web. We need to download scientific journals and upload them to file sharing networks' – Aaron Swartz, *Guerrilla Open Access Manifesto* 2008, cited in Maria Bustillos, 'Was Aaron Swartz Stealing?', *The Awl*, 3 August 2011. Available at <http://www.theawl.com/2011/08/was-aaron-swartz-stealing> (accessed 10 October 2016).

disillusioned with, disenfranchised from, or disgruntled about repressive forms of information governance continues to grow, will the leaking of large swathes of data become their most substantial form of protest? How will organisations and governments respond? Will the trend towards repression become increasingly violent? And what are the expectations of behaviour in the social spaces of the internet, which is so familiar to most young people as their preferred medium of communication and yet is still alien to many in charge of our legal, surveillance, political and business organisations? The protocols and norms are not stable and are being evolved in an atmosphere of significant political and social contestation.

In a less political example, interesting discussions on the ethics of tweeting are being discussed within the academic community. Just when does the information you are tweeting from a conference proceeding actually belong to someone else, and what is appropriate attribution, and ‘who gets to decide how dissemination of that knowledge happens (where, and when, and who the audience will be), who has the “right” to share ideas’.²⁷ The four authors of this book, for example, all support in a general way the notion that information should be free and have no problems with the reuse of what we write. In fact, that is what we are hoping will happen; but do our publishers share the same view, and what about the problems this can cause for teachers engaged in assessment of students? It is a new world and there is a lot of negotiation about rules of access ahead of us all.

5.7 Expect it to Get Worse Before it Gets Better

From the 1980s organisations gradually lost control of the dissemination of their information, the reasons for which require further research; we have pointed to two of the reasons in our short history in Chapter 2. The increase in transactionality during the twentieth century led to the development of goal-setting management strategies that, by the 1980s, were unfriendly to the detailed controls of Weberian styles of administration. At the same time our information and communications technologies began to diversify and expand, creating a technocracy that was in charge of a data processing-based approach to informatics in organisations, which began to dominate

27 Melonie Fullick, ‘Tweeting Out Loud: Ethics, Knowledge and Media in Academe’, post to *The Impact Blog*, 12 October 2012. Available at <http://blogs.lse.ac.uk/impactofsocialsciences/2012/10/16/fullick-tweeting-out-loud/> (accessed 10 October 2016).

all other approaches. When internet and web-browsing technologies were brought together in the early 1990s, computerisation processes designed to share information suddenly had the chance to go feral, providing unparalleled ways of linking documents across a network and creating major problems for the authoritative management of electronic memory of the type that have been discussed in this chapter. The marriage of the two technologies has altered both our ways of forming knowledge and the way we view it. Social and organisational interconnectivity using internet protocols and the connectivity of information referents using web-browser protocols have created a third force, cloud computing.

Control of the once crucial in-house design and storage services of data created by business applications is also shifting from the organisation to external service providers. Depending on the cloud deployment model, the extent to which those service providers are independently vetted or monitored for their trustworthiness or service quality will vary greatly.

It is reasonable to assume things will get worse before they get better. Cloud computing totally disrupts the mental models we have for the rules by which organisations control the capture of records and formation of archives. It poses major challenges to those who want to regulate the dissemination of information. Clashes are developing between the laws of different jurisdictions as data moves continuously from one location to another, depending on storage availability, making that data locationless. Dan Svantesson from Bond University points out the problems this causes for international law:

Cloud computing, by its very nature, transcends location, geography and territorial boundaries. Data accessed in one country might be stored half way across the world, or even in servers in multiple countries. International law, on the other hand, sees the world through the lens of various jurisdictions, which are inherently linked to location, geography and territorial boundaries.²⁸

Quoting US former Homeland Security secretary, Michael Chertoff, Svantesson advocated that ‘the current free-for-all of competing nations needs to be replaced with an agreed-upon international system for newly

28 Dan Jerker B. Svantesson, ‘A New Legal Framework for the Age of Cloud Computing’, *The Conversation*, 3 February 2015. Available at <http://theconversation.com/a-new-legal-framework-for-the-age-of-cloud-computing-37055> (accessed in 11 October 2016).

designed choice-of-law rules for data in the Internet Cloud'.²⁹ Given the multiplicity of complex business and information-based applications that need to be covered by new rules, is this a realistic proposition? Are we likely to continue our descent into chaos, at least until we start to look a lot harder at the complexities and the different solutions that might be required for different applications?

The difficulties in gaining control of cloud computing can be viewed through the lens of the disappointing results in the archival profession of a glimmer of thought about postcustodial archiving in the 1990s. Archivists with fresh ideas about archival custody first began to appear in that decade, prompted in part by the work of David Bearman on archival methods.³⁰ The chronicler of the history of archival thought in that period, Terry Cook, identified some of them when on a tour in Australia. Apart from himself there was Bearman, Glenda Acland, Sue McKemmish, Angelika Menne-Herritz and Frank Upward.

While Cook was working from the literature, in Australia at the time there was no wedge between theory and practice; three of the Australians he named had been practitioners in the Commonwealth Archives Office, and there were many others who could have been named, including Chris Hurley, Sigrid McCausland, Anne Picot, Michael Piggott, Barbara Reed, David Roberts and Steve Stuckey. They formed a mixed group with many different perspectives, but what many had in common was a suspicion that Stuckey was right when he argued that archives (young or old) might well come to be better managed if custodial archival institutions could no longer get their hands on them, and not just when the focus was on electronic memory. They envisaged using the expanding storage and dissemination power of computerisation processes to create archives as monitors and managers of the trusted third parties being used for the storage of memory.³¹ They called for what Frank Upward termed 'distributed custody':

29 Svantesson, 'A New Legal Framework', The Sony Pictures email example, noted in Chapter 2, and the responses of the US and North Korean governments provide a recent example of how the free-for-all is spreading into cyberwarfare. In another example of competition among nations, the differences between the Chinese and US governments on internet management and control were made clear when Google tried to penetrate the Chinese market. In the process they lost goodwill in their heartlands because of what they would have been willing to concede, and were rebuffed by the Chinese government anyway in the strongest terms. The Chinese are now creating their own lords of the internet, such as Alibaba.

30 David Bearman, 'Archival Methods', *Archives and Museum Informatics* 3.1 (1989): 49–58.

31 Frank Upward, 'Structuring the Records Continuum. Part One: Postcustodial Principles and Properties', *Archives and Manuscripts* 24.2 (1996): 268–285.

Postcustodial practice in Australia is already beginning to put together a substantial array of structural properties. These developments are canvassed in the article by O'Shea and Roberts in the previous issue of *Archives and Manuscripts*. They include policies and strategies, standards, recordkeeping regimes, and what has come to be termed distributed custody.³²

The term was picked up in a later report during the formation of State Records NSW,³³ but that organisation had to battle against too much resistance in the following years to make much headway in developing new forms of custody. There are many social, cognitive and technical reasons why the postcustodial movement of the early 1990s was a premature development. The technologies had arrived, but not the informatics-based professionals to implement change. Too few archivists could imagine distributed forms of custody and none could deal with creating the sort of regulatory mechanisms that were needed. Many of the institutions in which archivists worked increasingly took themselves off onto a cultural heritage shunt. Faced with the impossibility of dealing with the modern expansion in the continuum of recorded information, who can blame them? Even for those archivists who wanted to do something, there was no agreed set of actions. Meanwhile, within the relatively unregulated custodial information spaces of the internet and web-browser protocols, the concept of distributed custody was swallowed up and spat out again as cloud computing, but without any adequate regulatory control.

As we have shown in this chapter, organisations have sometimes succumbed to a misdirected data-processing approach, creating an illusory world in which information governance is all about protecting massive silos of information by firewalls. Within that illusion, the quality of the system and the material in it is less important than the quantity that can be produced, stored, and searched using the power of information retrieval technologies. In the next chapter we will begin to open up the chance of developing cloud computing techniques and technologies in ways that make more sense from a professional postcustodial archivist's perspective. Could we have a cloud-driven approach that respected reinvented forms of archival

32 Frank Upward, 'Structuring the Records Continuum. Part Two: Structuration Theory and Recordkeeping', *Archives and Manuscripts* 25.1 (1997): 10.

33 David Roberts, *Documenting the Future, Policies and Strategies for Electronic Recordkeeping in the New South Wales Public Sector* (Sydney: Archives Authority of New South Wales, 1995).

functionality, with particular reference to the development of appropriate storage, appraisal and provenance techniques? Can we build archival castles in the clouds and, if so, will that improve our life-chances, allow for better spacetime management of issues, and improve our mutual associations?

Postcustodial archives have arrived without any input from professional archivists, but a few can draw some very cold comfort from having been harbingers of cloud computing. Using today's language, within postcustodial archiving you can look to draw down applications from application stores in the 'clouds', use them within transactions, and store recorded information of use to them or arising from them back in the clouds using service providers who provide vast banks of storage units.

In the professional archivist's models, however, the focus was upon authoritative information resource management. They hoped that the traditions of the archivists would not disappear but would be transferred into nanosecond archiving within electronic recordkeeping processes. Instead, the postcustodial archive is arriving with inadequate attention to issues that should be at its heart, such as the capture of quality records and the formation of usable and useful archives. There are many signs that a more mature discourse is developing about electronic archiving outside the archival profession as technologists begin to think about archival functionality. We will look at that growth of thinking in the next chapter; but will it be transferred into records management and archival practices for the dissemination of records about our actions?

RECORDKEEPING FUNCTIONALITY FOR A DIGITAL AGE

6.1 Reinvention, Innovation and Integration of Storage, Appraisal and Provenance

Some archivists and records managers have not been shy in stressing the importance of authoritative information resource management and the importance of recordkeeping processes to any society.¹ The authors of this book, similarly, have no doubt about the fundamental significance of basing recordkeeping functionality in an organisation on healthy information cultures that support authoritative information resource management, the structuration of records within business records management, and maximising the dissemination of information while protecting genuine organisational interests.

The same archivists and records managers have been aware, however, that for the last thirty years the gap between the rhetoric surrounding the importance of recordkeeping and the ability of archivists and records managers to deliver consistent results that come close to matching that rhetoric has been growing larger. The first coherent tract on the gap between archivists and their statements of purpose was a discussion paper by David Bearman first published in 1988 on archival methods.² Over the next decade Bearman was at the forefront of a small reinvention movement. In some senses this book is a continuation of the refrain for reinvention, but

1 See, for example, Sue McKemmish, Michael Piggott, Barbara Reed and Frank Upward (eds), *Archives: Recordkeeping in Society* (Wagga Wagga: Centre for Information Studies, Charles Sturt University, 2005).

2 David Bearman, *Archival Methods* (Archival and Museum Informatics Technical Report, No.1) (Pittsburgh, Archives and Museum Informatics, 1989, republished in 1991 as Technical Report no. 9)

it has a sharper and narrower focus upon the essence of recordkeeping and the bundling of activities grounded in language and communication.³ A key element of recordkeeping through the centuries has been the bundling of records from inscriptions arising out of human activities and related communication chains. It is this basic motif that is the foundation of this chapter, which, in part, deals with reinventing recordkeeping functionality that can connect with the emerging emphasis upon agile computing in information systems design and development.

Reinvention, however, is no longer enough. In recent years the aim of establishing new strategies, tactics and structures for recordkeeping practices has never been far below the surface of archival discourse. The advent of cloud computing has made innovation an urgent issue as archivists survey a modern information landscape in which nanosecond archiving processes have become a supreme challenge to all organisations and the old linear divisions separating records management and archival processes no longer make any sense. Indeed, one of the problems is that we have been trying to reinvent the document in a digital era within office software, rather than taking an innovative approach to the possibilities offered by internet-based business applications that make cloud computing a much more threatening experience than it should be, as we demonstrated in the previous chapter. The operational hole in relation to the bundling of activities within administrative processes is in the very technologies themselves and in attempts to reinvent document management within office software and email systems, whether in Microsoft Office, Sharepoint, or in email systems, such as Gmail or Outlook. The long-standing mimicry is only just emerging as a problem as the need for the better bundling of communications within cloud computing becomes more apparent every day. From the outset, Microsoft Windows, for example, had a registry behind the screen that drove location control of individual documents on the system and a user-dependent file and foldering mechanism; while the number of activities that can be undertaken has expanded exponentially, the basics of document location registration and techniques for on-screen filing and foldering from a user's perspective remain primitive. The user creates a document and puts it in a folder, which is a simplistic parody of paper recordkeeping processes.

3 Discussed in the Preface, with reference to Mark Aakhus, Pär Agerfalk, Kalle Lyytinen and Dov Te'eni, 'Symbolic Action Research in Information Systems: Introduction to the Special Issue', *MIS Quarterly* 38.4 (December 2014): 1187–1200.

Any modern incapacity to handle cascading inscriptions is likely to be attributable to the use of office software that is still rooted in a 1980s document management paradigm. While that paradigm prevails, robust cloud-based paperless offices will never develop to their full potential. That is the theory, anyway, and for the grander visions of some archivists to become a reality, sophisticated approaches to recordkeeping functionality are going to be needed. The path to a robust paperless office will be through the adoption of a much more innovative approach to the bundling of activities.

This chapter will focus on three major functions – storage, appraisal, and provenance – opening up a conversation about them that will suggest a few possibilities for reinvention and outline the need for innovation in a world of cascading inscriptions. It will then discuss a fourth function – classification – within a focus on integrating the other functions within a spacetime distancing approach. The collective aim of the four functions, along with the reinvention drive and the search for innovative methods, will be to embed records capture and archive formation into the action of agents and organisational business processes.

In summary, there is no doubt in our minds (or many other minds these days) that traditional practices for storage, appraisal and provenance need reinventing. Existing methods have been collapsing under the stress of the expanding continuum of recorded information and the lack of a professional network to monitor and audit their performance. Like office software, the methods need to be incorporated into business applications and not to sit like shags on a rock outside them. Reinvention, however, will not be enough. Innovative new methods are needed to cope with the cascading inscriptions of modern business applications and those new methods will need to be directed at fractals, patterns within the complexity. If new methods are not achieved, recordkeeping informatics professionals will constantly lag far behind in a changing game. The methods do not just need reinvention and a healthy dose of innovation; they need integrating.

6.2 Reinventing Archival Storage

In the paper era the increasing failures in recordkeeping functionality owed much to the separation of different functions in linear fashion from business activities. The links between action, process and records that used to be the hallmark of sound administrative processes began to crumble away. The

bundling of activities suffered at the expense of end-product management to the point that the main American archival journal was happy to publish an article in the 1980s arguing that archival theory was much ado about shelving.⁴

Over the last thirty years, records management and archival administration have both struggled to throw off simplistic end-product views of storage. Both groups claim to be much more than just janitors. There is an irony in this. In reality, within electronic communication processes the janitorial processes of storage long ago ceased to be a matter of putting things on shelves and become a logical jig-saw puzzle requiring behind-the-screen integration of individual, group, organisational and plural information stores. There is nothing wrong with being janitors; it is the methods that were the problem, based as they were on sweeping up after the Lord Mayor's parade had passed by. Janus, the two-faced God in Roman mythology, had the sense to look forward and back.

For the last fifteen years, storage beyond the screen within cloud computing has grown until, as we noted in Chapter 4, it now involves complex decisions about what should be in the back office of an organisation, what should be available from the front web office, and what should be placed in any number of possible storage points internally and externally. Separate and linked stores can be set up to serve individual, group, organisational needs, while the new plural archives can be forming in the clouds. The existence of both public and private clouds within business processes can be treated as simple divisions, but for business purposes they have to be thought of as involving a complex array of decisions about how to represent information, how to manage its dissemination, and how to retrieve information objects and information about the immediate contexts of interaction that produced them. Those decisions need to be made from within the business applications themselves.

Technologists have been trying to reinvent bundling processes, but, as we noted above, their paradigm has been the document and filing it in folders, rather than the ongoing motion of recordkeeping processes or the need to manage cascading inscriptions. There is a need for organisations and informatics professionals to step in and do a better job. Modern information and communication technologies have the potential to enable activity bundling to be embedded into business processes and the action of agents, but we

4 John W. Roberts, 'Archival Theory: Much Ado About Shelving', *American Archivist* 50 (1987): 66–74.

live in a computing world in which archives and records management have been relegated to minor end-product issues. Records managers and archivists have spent thirty years discussing the management of emails, but the systems continue to be deficient when it comes to managing cascading inscriptions in a manner that meets business requirements.

In the 1990s, as part of the reinvention movement, a handful of recordkeeping professionals in Australia produced records management standards, in part as a defence mechanism against the collapse of embedded approaches to records and archives management. For them, recordkeeping in its embedded business-process forms of the paper era had been about an array of techniques directed at bundling activities within communication chains and paying attention to language issues; they wanted to produce a media independent standard for those bundling processes. Those techniques include:

- registration processes,
- workflow analyses based on the role of documents as drivers and shapers of action,
- work-process analyses that looked at when records would be needed to support further action,
- the physical format of records and the logical format of communications, and
- records management classification techniques as part of a chain of transactions and a way of building bundles.

Globally, the sense of a media-independent standard for records management was recognised and the Australian work laid the foundations for international standards. Outside of Australasia and some parts of Europe and Asia there was, however, only limited experience with embedded forms of recordkeeping. In the Anglophonic world end-product records management and document management paradigms have proven to be particularly strong in government recordkeeping, lessening the possibility of the emergence of the hypertext-like network needed to develop recordkeeping functionality for the digital era across all business activities.⁵

5 See, for example, Steve Bailey, *Managing the Crowd: Rethinking Records Management for the Web 2.0 World* (London: Facet, 2008). We would argue that the task is to adjust to the cascading documents in the Web world and that the document management aspects of Web 2.0, including Archive 2.0 and Records Management 2.0, were one more sign of how entrenched individual document management paradigms from the paper era have been.

Fostering this emergence is one of the drivers for this book. There is potential within agile computing to explore new ways of doing things (see the next section), but it can also be used to continue to explore the reinvention of recordkeeping functionality based on understandings of the genuine complexity of particular tasks in modern organisations. For example, within their own boundaries, business applications can be used to reinvent embedding processes such as:

- the workflow analysis and the management of the communication chain in correspondence registry systems in the paper era,
- the maximisation and control of access to bundles of activities within Weberian styles of administration,
- the file as a transaction history,
- activity classification techniques (In nanosecond archiving, activity classing is a particular problem that needs to be looked at within the requirements and operation of individual applications),
- storage formats for recordkeeping informatics,
- the use of diplomatic forms for communications and business (The forms-based diplomatics of communications provided protocols; Web-based business applications are already using forms extensively, but their use is not yet tied into maximising the benefits that can be gained from using the new computational flexibility in relation to the reception and use of those forms).

In theory, if archivists and records managers as recordkeeping informaticians were part of a strong enough agent network, these types of reinvention could come very quickly; but, in practice, too few of them share a disciplined informatics base with others or a recordkeeping informatics base across the archives and records divide for the network to spring up. The need for reinvention will, however, not go away merely because too many people do not dare to stare the tiger in the eye. Action is needed at various levels, from the way societies organise the regulation and resourcing of recordkeeping, the way informatics professionals address the custody of archives and records, the way organisational information cultures serve authoritative information resource management, to the way groups and individuals contribute to the better bundling of activities. In this meta-prescriptive list one component, custody, is screaming out for an innovative recordkeeping informatics approach.

6.3 Storage Innovation and the Postcustodial Archive

It is going to take some time to reinvent recordkeeping methods of administration in which organisations can see themselves as bundles of activity, but it is necessary to do so. In relation to the need for innovative approaches to custody, however, the changes have already arrived in the guise of cloud computing. Organisations have had trouble retaining custodial control of their own records. The postcustodial archive is now a reality and so too, as we showed in the previous chapter, is the vulnerability of electronically stored memory.

The new reality should not be a surprise to archivists. As we argued in the previous chapter, a handful of postcustodial archivists in the 1990s advocated distributed rather than centralised forms of archival custody and the need for innovative approaches to storage and to recordkeeping functionality.⁶ Two Australian archivists, Steve Stuckey and Glenda Acland, presented what was needed as concisely as possible. Stuckey argued that archives would be better looked after once archivists no longer laid hands upon them and Acland argued that, for modern records, it was time for archivists to become auditors, rather than undertakers.⁷ The postcustodial archival movement was not widely influential at the time, partly because most archivists thought in terms of how existing rules and resources for custody could be applied to electronic and digital archives, which was a task of reinvention. Distributed custody was likely to be dismissed on the grounds that it could not be done, which was true under the old rules for the game. What was needed was innovation, rather than the same old thing in new clothing. Innovation has come from the technologies and those

6 There was an overlap between the postcustodial archival movement and the records management standards movement in Australia. The connection was simple enough. Without adequate records management standards, the emerging forms of computing at the time were highly likely to produce custodial vulnerability, which is exactly what happened. The four postcustodial archivists on the Australian Standards Records Management Committee were Barbara Reed, David Roberts, Steve Stuckey and Frank Upward, and they drew upon considerable support from Glenda Acland, Sue McKemmish, Anne Picot and New South Wales Records Management Office staff.

7 Steve Stuckey, 'Keepers of the Fame? The Custodial Role of Australian Archives – its History and its Future', in Sue McKemmish and Michael Piggott, *The Records Continuum, Ian Maclean and Australian Archives First Fifty Years* (Melbourne: Ancora Press, in association with Australian Archives, 1994), 46–47, and Glenda Acland, 'Archivist – Keeper, Undertaker or Auditor?' *Archives and Manuscripts* 19.1 (1991): 91–95.

without any knowledge of the old rules and the old game. Archivists have been regularly absent from the processes of archive formation and control.

As we mentioned above, there is a logical truth in the need for a Janus-like view of storage. Archivists and records managers in the past might have made much ado about shelving, but today cloud computing has become the new shelf. You can take applications and software off it and put your records and archives on it. Potentially archivists and records managers have been thrust back into the forefront of major governance issues. The new janitors can explore the new shelf in innovative fashion within business applications. They can focus attention on cascading inscriptions while addressing various distributed-custody issues, including using third parties to hold a secure and reliable business record during transactions, how to maximise the use of multiple storage points to serve different needs or to provide for disaster recovery, how to develop standards for nanosecond archiving, and how to conduct the auditing and mentoring of storage security within new distributed arrangements.

Innovative methods can emerge from a focus on how to make maximum secure use of cloud computing and its nanosecond archiving capabilities. The multifaceted analyses suggested in this part of the book can help define what inscriptions, including information objects and recordkeeping metadata, will need to be captured and archived within regulated routines, the nature of security requirements, the breadth and diversity of access rights, the use of forms, and the retention periods relevant to records of specific work processes. Collectively, such considerations, internalised within business applications, can help build a twenty-first-century information culture that respects authoritative forms of information resource management and is not overwhelmed by the expanding productive power of the information and communication technologies. The technologies should be the tools of business processes – not their master.

At present there is a vacuum and the technologies oppress us as much as they liberate us. Businesses resist the formulation of strict recordkeeping rules for obvious reasons. Embedding administrative formalism into processes can still work for repetitive business applications, as is evidenced by the continuing success of workflows for such routinised processes as insurance claims or the processing of invoices, although there are major business failures even in these, as those who have had unusual fraudulent payments approved by their Net-bank against all transactional common sense will attest. Even banks build an acceptance of poor recordkeeping informatics into their cost-benefit analyses of their business applications. The experience

of the later years of the paper era still suggest that adequate recordkeeping is more expensive than writing off a small percentage of transactions as fraudulent. The idea that recordkeeping can stultify the possibilities for change and dynamism, like the obsession of even leading-edge technology providers with end-product document management paradigms, is a legacy of paper minds. Without adequate recordkeeping protocols the productive power of our technologies induces chaos. An innovative approach to authoritative information resource management from digitally attuned recordkeeping single minds can help curb that chaos and, at the same time, will save money.

Governments and organisations can dismiss the problems of the chaos components of cloud computing as part of a trade-off for the wonders of information and communication technologies, or they can study them within modular and tailorable business applications. Agility is the watchword, and almost every aspect of cloud computing as a formation method for nanosecond archives will require innovative forms of recordkeeping functionality. The goal should be to help in the creative evolution of mature forms of cloud computing as a trustworthy business tool that connects to the storage of the archive in many distributed points, according to the needs of the business application. That, in turn, will require enhanced appraisal and provenance functionality. In the next two sections we will look at reinventing appraisal scheduling and encourage readers to think about how to be more innovative in evaluating what records need to be created and what should be subject to managed forms of nanosecond archiving.

6.4 Reinventing Appraisal

With the expansion of electronic communications, archives and records management functionality relating to storage floated off into information spaces remote from the direct recording of action. The removal of such functionality from the aegis of archivists and records managers is being further advanced by cloud computing. Something similar has been happening within what many Australian archivists would regard as the traditional approach to appraisal, which had its origins in federal government programs in the United States after the National Archives and Records Administration accepted a baton-changing relationship between archivists and records managers in the 1950s.⁸ NARA attempted to remain in some

8 Australian reaction to this approach is discussed in Chapter 2 (section 2.3).

contact with archival formation processes by providing an authorisation point for the retention and destruction of records across all agencies as part of determining what should be transferred to the archival authority once the administrative use of records had ceased. It was an approach that was widely adopted in other Anglophonic countries, including Australia. In theory, in accepting this approach archivists could remain in contact with current recordkeeping issues; in practice, the separation of archives and records management functionality has weakened the presence of both groups in a universe of electronic communications and nanosecond archiving.

The traditional tools that have been available to assist organisations determine what records they should keep and destroy have been generally known as retention and destruction or disposition schedules. The schedules of government and non-government organisations have been drawn up by records managers or archival consultants in the first instance. In government they would be submitted for approval to an archival authority. They typically authorised the disposal of groupings of records (that is, bundles of activities). In Australia in the 1990s the grouping of activities in Commonwealth government agencies was often broadened to a grouping of functions, which was one of many ways tried by archivists in adjusting to the expanding continuum of recorded information.⁹

The schedules have been written at a high level of abstraction and have often depended on human interpretation for implementation. Even in specialised environments where recordkeeping professionals managed the controls, these tools might not have been working. To implement them, the schedules need to be mapped quite precisely to the specifics of their implementation, and there is no control or authentication of the mapping process. Accordingly, claims about compliance with authorised schedules can be made, but have never been tested during implementation processes, perhaps contributing to the failure of new methods to evolve. There have been some very bad implementations out there.¹⁰

9 For a short but concise continuum-based critique of functional appraisal in the context of other methods, see Chapter 7 *The Archives*, p.177-181 in Sue McKemmish, Michael Piggott, Barbara Reed and Frank Upward (eds), *Archives: Recordkeeping in Society* (Wagga Wagga: Centre for Information Studies, Charles Sturt University, 2005)

10 The authors of this book have had personal experience of some of the problems, but examples are hard to pin down because archival authorities have not made public any evaluations that may have been carried out. As far back as 1982, the New South Wales Branch of Australian Archives undertook an evaluation of whether agencies interpreted disposal schedule provisions in the way that they were intended to be read and found that there was very little correlation between their intention and their

Some might argue that any attempt at appraisal is a waste of time anyway. It is not economically viable in a world of big data where digital storage costs can be low. It is not practical in a world of expanding transactionality and cascading inscriptions where there is so much to appraise. However, you can probably only form such negative views if you regard records as end products rather than as crucial components of the network between agents, business activities and the storage of records as bundled activities. The economics and practicalities of appraisal have to take into account the costs of poor recordkeeping and the resultant crime, corruption, and major decision-making errors. Appraisal can be reinvented as a quality management task directed at access and dissemination issues within business applications and scheduling can address disposition, which, as we saw in the discussion of storage, is now a complex task with many alternative storage points possible and even single documents capable of being stored in multiple places. At the very least, organisations can aim to appraise their action-based records for the adequacy by which they are captured, formed into an archive, and distinguish the good oil from the sludge.

The reinvention of appraisal is easy to call for, but how do you appraise cascading information inscriptions in ways that, from an organisational perspective, can contribute to the cardinal authoritative issues of respect for clients, partners, colleagues, proper consideration of spacetime management, and the development of mutually beneficial associations? Our standard answer in this book is that internet-based business applications can reinvent the scheduling tools that underpinned appraisal in the paper era using recordkeeping metadata and spacetime distancing-based classification mechanisms across inscriptions, records stores, the organisational archive of action, and the plurality of archives. Internalising appraisal scheduling tools within business applications can help embed recordkeeping into the actions of agents during business processes across an organisation's business activities. It is an ideal locale for appraisal because it places the developer of the schedules in touch with the complexity of the parts while working towards a pragmatic recordkeeping architecture for whole archives based on tailorable modules. The analysts need to function as a network so that patterns are identified that provide a special focus for module development. The process of fractalisation via the business application can save every organisation from reinventing the wheel.

reading. The central office of Australian Archives noted the report but did not initiate any further investigations, (This note is written from personal knowledge alone, as the practical failings have never been formally acknowledged in archival literature.)

In terms of disposition and the complex private and public choices now available to any organisation, managing the complexity of the parts matters. It is not access to information that organisations should seek to ensure within their business applications so much as access to specific subsets of information. How information subsets will be valued is contingent upon the business activities, in conjunction with an assessment of their relevance to other subsets. Records, when the management of the subsets demonstrates that it is needed, should be capable of acting as evidence of actions providing information with traceability to enable assertions on authenticity and reliability to be made as the information travels between different environments for formation, storage and use. Users of the data can then use business systems that provide greater help in determining what information can be trusted. In short, the reinvention of appraisal techniques in this century should focus as much as possible on how much trust can be placed in the records of actions and the how, what, when, where and why issues underpinning the now theoretically complex storage and access tasks within cloud computing.

6.5 Appraisal and Innovative Approaches to Trust

For robust business uses of electronic memory capabilities, the necessary precision of immediate storage and location decisions can be scheduled within business applications. Recordkeeping informatics that addresses cloud computing, however, requires innovative strategies, tactics and structures and not simply the reinvention of disposition schedules. There is no equivalent in the single point storage systems of the paper era to the multiple storage options within cloud, off-site and back office information storage locations. Yet, as we argued above, changes to the rules and resources for access are being introduced to the world by technologists who, within the vast innovative creativeness that has been occurring, have often not outgrown an archaic simple mental image from the paper era of how to go about filing and foldering records of action. Too often there is a hole in our information buckets caused by our failure to appraise how we bundle communications as part of business activities, a pre-condition for the management of access issues.

From an organisational perspective, some interconnected appraisal-based recordkeeping practices from the era of paper are dying, which makes the need for innovative approaches to disposal and appraisal in cloud computing even more urgent. First, there is a need to get beyond isolated taxonomies of

value decisions about what information objects need long-term storage for business purposes. There are too many of them, and decisions made in relation to them by creators within nanosecond archiving would be inconsistent anyway. Once the economics of storage change, the issue becomes whether it is worth putting in the effort to appraise single referents in the first place. Second, organisationally located archivists could take a lead from emerging archival approaches to memes as a new focus for appraisal. Within organisational information cultures, archivists now have to find appraisal techniques suited to a world where the cultural issues underlying trust in records are changing and digital recordkeeping has caused a convergence of storage elements in the world of galleries, libraries, archives and museums (GLAM).

The complexity of GLAM is discussed in the next chapter, but the ramifications for recordkeeping informatics-based appraisal touch upon fundamentals. Decisions no longer have to be based on understandings of what a toenail of the elephant means in terms of knowledge formation. Hyper-appraisal techniques can be built across the archival multiverse covering the spacetime distancing of recorded information of all types.

For example, in 2015, an award-winning article in the Australian journal, *Archives and Manuscripts* dealt with ghost signs – those remnants of promotional signs that can be seen on walls around most cities in the world.¹¹ The community archiving movement, of which the photographic archiving of ghost signs can be a part, canvasses a host of different artistic, text-based, action-based and artifactual information objects. This eclectic approach to appraisal based on a new array of values has been opened up by digital technologies, and authoritative information resource management cannot escape its spread. In another example, one research program, ‘Trust and Technology: Building Archival Systems for Indigenous Oral Memory’, covered ‘issues relating to storytelling and story recording, trust and authenticity in oral and written records, trusted custodians for recorded stories, control, ownership, access, privacy and experiences of using existing archival services’. It evaluated existing archival services (that is, appraised them within the language of appraisal being suggested here) and developed a specification for a Koorie Archiving System (KAS), challenging ‘official’ archives.¹²

11 Lisa Cianci and Stefan Schutt, ‘Keepers of Ghosts: Old Signs, New Media and the Age of Archival Flux’, *Archives and Manuscripts* 42.1 (2014): 19–32.

12 See Fiona Ross, Sue McKemmish and Shannon Faulkhead, ‘Indigenous Knowledge and the Archives: Designing Trusted Archival Systems for Koorie Communities’, *Archives and Manuscripts* 34.2 (2006): 112–151. Available at <http://infotech.monash.edu/research/about/centres/cosi/projects/trust/rmf2006.pdf> (accessed 12 October 2016). The project has the authoritative information resource management hallmark

On the surface the Trust and Technology project might seem irrelevant to organisational archiving programs, but that is a blinkered and unconnected view of the role of corporate archives. Leaving aside the fact that transactions are two-sided and for organisations to be trusted they have to respect the other side of their transactions, archives in the paper era were established to provide trust in the organisation, based on its longevity and the integrity of its approach to business over decades. Corporate archivists now have to adjust to what has been given the memorable label ‘cute cat theory’ and find new connections with the issue of trust. As one Melbourne academic, Jason Potts, has pointed out, the emerging world of applications is creating an information landscape which is ‘faster, shorter, of lower quality and with much more in it. Cat memes are a perfect example of this’.¹³ Cute cat theory, developed by Ethan Zuckerman, is a graphic explanation of the superficiality of the allocative side of modern information and communication technologies, the way it causes people to temporarily lose sight of authoritative information resource management, and the way such absent-mindedness can be exposed when it is least expected.¹⁴ In Tunisia in 2011, a group of activists began exposing corruption using Direct Motion, a video-sharing application. Government authorities, obviously without the input of a recordkeeping single mind, blocked access to the whole application and, in doing so, they blocked access to cat videos and the like, upsetting the general population and not just the handful of people seeking out the political material. Their actions provoked a public outcry that played a part in subsequent democratic uprisings in Tunisia, often identified as the beginnings of the Arab spring.

Cats touch deep wellsprings of symbolic interaction in most of us that run across cultures and through time. Organisational archival programs can reflect this meme-based approach to developing trust, and, like most such tools, the approach can be put to nefarious use. Recordkeeping, as we keep arguing, is morally indifferent, which is why informatics professionals

of a Monash records continuum approach, using the plurality of information to challenge the single viewpoints usually present in the archival formation processes in the paper era.

13 Potts is quoted by Andrew Masterson, ‘Memewhile ... How Cats Won t the Internet (and Helped Kickstart the Arab Spring)’, *Sydney Morning Herald*, 14 December 2014. Available at <http://www.smh.com.au/digital-life/digital-life-news/memewhile--how-cats-won-the-internet-and-helped-kickstart-the-arab-spring-20141209-1235g5.html> (accessed 12 October 2016).

14 ‘Cute Cat Theory of Digital Activism’, *Wikipedia*, https://en.wikipedia.org/wiki/Cute_cat_theory_of_digital_activism (accessed 12 October 2016).

need to take ethical stands. It is not accidental that cats featured large in Islamic State recruiting videos in 2015. Organisations that seek to survive across spacetime, operate within stable mutual associations, and protect their own life-chances are not only those that practise toleration and humanity; any person or organisation can distort cultural issues. Even beheading is a cultural meme, albeit one that most of us think is barbaric. Islamic State technologists use beheadings and cats to support intolerance and fascist opposition to difference. They may have absorbed the meme-based lessons of Tunisia, but what they have not absorbed is that our hyper-wired world has many interconnections. Actions, whether the invasion of Iraq in 2003, the suppression of means of expression in Tunisia in 2011, or the slaughter of civilians in Paris in 2015, can have unanticipated consequences. Nothing is more practical than structuration theory. The existence of major consequences from the flow of interconnected things in motion should never take any organiser of activities by surprise given that it has been recorded so often in human history; yet it usually seems to do so.

The lower quality, but very vibrant, modern information landscape has to live alongside changing concepts of trust, and recordkeeping informatics needs to play its part on the side of trust. Socially responsible organisations at both the global and local level will be seeking to separate themselves from the fraudulent and unethical approaches of many of those who are exploiting modern technologies. They also have a vested interest in opposing any extreme profiteering by some software providers, given how significant business communications are to their survival. Similarly, responsible governments will need to do more to support trustworthy organisations than they do at present.¹⁵ Business communications are not a free-market issue, other than in the sense that they should be as cheap and robust as possible.

In the paper era the form of recordkeeping within business processes was regulated in many societies in ways that made deceit, dodging taxes and crime more difficult than it now is in the digital world. Innovative tools are

15 A number of crucial trust issues impacting the rules and resources by which organisations will operate in future have emerged in recent years. One relates to global taxation regimes and pricing policies. In Australia, for example, there is growing community dissatisfaction, as there is in most countries, with the way some global organisations use tax havens to avoid paying taxes on the profits of their Australian operations. Australian governments at federal, state and local levels, like those in many other countries, constantly need to increase budget allocations to try to hold back the rising tide of cybercrime.

needed to develop protocols for this century. Appraisal schedules operating within internet-based business applications are one tool that needs to be looked at. Unfortunately, innovation never springs from policy-based prescription; it comes from action, and from the cumulative impact of new actions. The ongoing hyper-wired actor–network for recordkeeping informatics does not exist yet, so action is thin on the ground, and any comments we make about the future of recordkeeping functionality in this chapter can only be tentative. It is easy to say here that the focus of future appraisal techniques should be increasingly on transparency and accountability. We can also say that attempting to counter the spread of corruption and malfeasance within the wild frontier of technological change is an aspect of the control goals of nanosecond archiving within approved business applications. These meta-prescriptions are easy to formulate, but the parts beneath them are expanding in complexity daily and need to be addressed by generative actions, rather than words.

The issue of expanding complexity takes us to another dying concept from the paper era – the notion that records can be appraised after the record has been created. In this case the need for innovation comes from the expansion of information objects, manifest in a flood of inscriptions that must defeat individual appraisal techniques. Just as no-one can predict what culturally based techniques for appraisal will emerge, although we can safely offer the meta-prescription that they must have an ethical grounding, we cannot predict what innovations will emerge from the need to appraise cascading inscriptions within communication processes, although we can offer the meta-prescription that it will not bear any resemblance to old end-product-based appraisal techniques.

We can also state that appraisal schedules within internet-based business applications can be built around the motifs of contingency and containment set out in Chapter 1 of this book. Contingency involves the set of requirements operating within particular business applications suited to the business needs of an organisation. Appraisal schedules used to be a guide to whether records still exist. If they have a role in the future, it is more likely that it will be related to what records should exist, how robustly should they be captured, and what resources including rules and regulations have been put in place to manage nanosecond archiving processes. In an agile computing environment and from an organisational viewpoint, the application needs to be appraised for whether it is adequately capturing the right records, forming them into a useful and usable archive for future users,

and sending copies to appropriate storage points. You appraise the service provided by the application. Its end product can be used to monitor that service within yet to be devised audit methodologies, but it is not the focus of appraisal.

That is a way of handling the complexity of the part, but for most archivists the fun in appraisal in this century should lie in how actor-networks can link it into the management of the whole – the archival multiverse. Cultural memes are of interest to most of us; the detailed analysis of the agent, business process and records capture is an acquired taste requiring some recordkeeping single-mindedness. The two aspects of appraisal need to be brought into more comfortable alignment, and a contained and trust-based approach to appraisal will need to consider:

- What inscriptions involved in business transactions should be created in the first place?
- How robust the process of records capture needs to be for evidential purposes, varying from simple capture of an inscription as it crosses a communication switch to detailed recordkeeping metadata governing future actions and movement in spacetime?
- What functions do the transactions and activities fit under as part of the design of functional, modular and tailorable information/enterprise architectures for an organisation's archive of business actions?
- What communally developed and readily available nanosecond archiving methods need to be used to help the inscriptions negotiate archival plurality?

These questions are impossible to implement within old-fashioned approaches to appraisal. They take us back to examining the contingencies of the business application, which traditional approaches tended to ignore. They also attend to some of the clear deficiencies described in the previous chapter where the new mega-silos of information are failing to provide a secure and low-sludge content information base. It is not big data that is the problem; it is the lack of attention being paid to the agent, record, and business process relationships in the first place, which takes this chapter directly into the third inter-related major component of recordkeeping functionality, provenance.

6.6 Provenience [Source] and the Reinvention of Provenience

According to a longstanding definition by the International Council of Archives, the principle of provenance in archival theory deals with preserving ‘the relationship between records and the organizations or individuals that created, accumulated, and/or maintained and used them in the conduct of personal or corporate activity’.¹⁶ In other words, it was about something that was present in the paper era but has been going missing within electronic communications, the direct connections between an agent, its records and its business activities.

The definition points to the twinned components of the principle. The creation side points to the source, the provenience in Germanic archival theory, of an information object. The ‘maintained within the conduct of activities’ side points to transmission and, in English archival theory, also pointed to the idea of continuous custody and the moral defence principle set out in Jenkinson’s *A Manual of Archives Administration*. One of the principles of British civil service was the idea that organisations had a vested interest in maintaining accurate records of their actions and that unreliability can arise when the provenance chain back to a source is broken or when records cease to have administrative use but have not been transferred to the control of a responsible archival agency. That is now a naïve view of the behaviour of people inside organisations; continuous custody needs more innovative solutions behind and beyond the screen. Innovative approaches to custody will be looked at in the next section. Here we will focus on the reinvention of the source elements of provenance which we would like to term provenience to illustrate the distinction between source and transmission. Unfortunately end product archivists with their often narrow perspective of source in terms of a single creating agent have muddled the waters. Suffice it to say that provenance should be seen as a complex concept that goes well beyond creating or controlling agencies. It is multiple and continuum archivists attempt to document source and transmission across the lifespan of information objects as broadly as is deemed necessary (see chapter 8 on recordkeeping metadata).

The singular controlling source of an archive was established forensically in Jenkinsonian archival practice. It was seldom a difficult task if normal

16 *ISAD(G): General International Standard Archival Description*, 2nd ed. (Ottawa: International Council of Archives, 2000).

protocols for the creation of an inscription had been followed and custody had been continuous. Agency was built into the format of business communications via information at the head or foot of a document, particularly in letterhead and signature protocols, and the tradition is continuing in the digital era. Many provenance issues of nanosecond archiving processes are being discussed by the Web development community, database designers and others. The World Wide Web Consortium (W3C), for example, has issued discussion papers on the subject. One use case developed for news aggregators noted the need to ‘determine whether a web document or resource can be used, based on the original source of the content, the licensing information associated with the resource, and any usage restrictions on that content’.¹⁷

This is still a one-sided view of provenance that concentrates on the rights of a creative source, but transactions are two-sided. The headers and footers of diplomatic protocols in business correspondence acted as signs of the authenticity of the communication for the recipient. One of the litmus tests of the reinvention of provenance management will be how well identity management of relevant parties to a transaction is handled in recordkeeping informatics. Identity management within business communications using Internet technologies has always been an issue for technologists and many identity management conventions from the paper era have been reinvented, but there have also been ways of subverting those conventions through behind screen anonymity. When internet technologies first began to flirt with web-browsing, a cartoonist was quick to note that ‘On the internet, nobody knows you’re a dog’.¹⁸ A related identity management problem that the marriage of internet and web-browser technologies instantly exacerbated was identity theft. Hollywood film companies and fraudsters have both been quick to jump onto the accelerating complexity of such theft and its ramifications.

Paradoxically, anonymity is also disappearing. Now many people might know who you are down to minute details such as what brand of dog food you buy, which makes identity theft and misuse easier. People, as part of the situated context of transactions, are everywhere in records. Often, as the subject of records, their lives can be significantly affected. This has always

17 Provenance XG Final Report: *W3C Incubator Group Report* 08 December 2010, Available at <http://www.w3.org/2005/Incubator/prov/XGR-prov-20101214/> (accessed 12 October 2016).

18 Peter Steiner, cartoon in *The New Yorker*, 5 July 1993.

been the case, but never before have we had to deal with the access vulnerabilities created by cloud-based or networked storage of electronic memory. The intrusions are accelerating and the new trend towards internet-enabled objects means that, if you go jogging, make coffee, drive your car, or use your credit card, you must increasingly consider trading privacy for convenience. Often people will be committing records to service providers that get them to accept long and often deliberately unreadable contract provisions that, even if they seem to protect privacy, will have switch provisions that allow the conditions to change or make people subject to the rules of whatever country the organisation decides to store its data in. And sometimes the convenience for which privacy has been traded can disappear in a chain of unauthorised fraudulent transactions.

The twin dangers of dealing with dogs on the Internet and of losing privacy in order to live with the boons of technology are problems that many of us would like to look away from. They are central to recordkeeping informatics, however, and must be looked at in unflinchingly. Privacy and transparency logically are mutually exclusive subclasses of provenience [source] issues and the dichotomy, inflamed by the commercial and governmental surveillance that modern communication, data-gathering and warehousing technologies make possible, raises seemingly intractable problems that need to be handled by codes of conduct, rather than by black-letter law. For their own protection, organisations need to make their own efforts to get on top of identity management issues. Are they operating within codes that protect privacy while regulating and maximising access to their records as carefully as the type of business transaction requires? The problems are particularly difficult, of course, for organisations operating globally across jurisdictions where codes of practice relating to privacy vary. Large databases can be instantly copied from one juridical environment to another, getting around privacy rules and promises but damaging business associations with clients in the process. Different regulations and expectations also exist with regard to an organisation's right to protect its own transactional information and the rights of other parties to view that information, given that by definition such information is two-sided. How, globally and locally, do you set up the rules or provide the resources for dealing with the two sides of privacy, involving, on the one hand, the need to protect privacy and, on the other, the need to protect the persistence of identity for control purposes?

Within the European Union, for example, there have been debates about the 'right to forget', which raises issues about the persistence of information

through time. The subject of the record is beginning to be recognised and given rights to enforce action over data held about them; but this brings with it many recordkeeping issues. How do you disable embarrassing internet revelations affecting future prospects and stop them from lurking in the persistent digital shadow? Should people be able to require businesses to destroy data about themselves unless there is a 'legitimate' reason for its retention? How in a world of cascading inscriptions will it help to erase one or a few of them? Will the right apply to all information, or only some – only to information provided by individuals themselves and stored in a third-party service, or to everything in the 'historical record'? Is it really in the interests of wronged parties to destroy the record in one place if it has already had an adverse affect elsewhere? Will single-point management get to all the multiplicity of places in which the information might reside? What is reasonable retention?

Such issues relating to a right to forget raise appraisal and technocratic questions, but underneath them decisions must be made about one of the challenges facing all societies and being picked up in some jurisdictions. To what extent should there be a democratisation of our notions of who sets the rules for privacy and other rights, including copyright and information ownership? At its base, the right to forget envisages an environment in which individuals are empowered to determine what representation of them remains in the record. Spurred by the power of social media and the 'perfect memory of the internet', such a data protection framework could be applied to anything done electronically with any information about an identified or identifiable person. It can also be targeted at specific issues, aiming, for example, at providing protection for young people to manage their online reputation.¹⁹

The security of information also raises complex identity management problems relating to internal access within an organisation, as we saw in the previous chapter. Should whistle-blowing legislation protecting leaks made in the public interest override secrecy codes and oaths? Should the 'white

19 According to Matthew Newman, 'Rules are particularly aimed at young people as they are not always as aware as they could be about the consequence of putting photos and other information on social network websites, or about the various privacy settings available'. Newman noted that this could cause problems later if there was no way of deleting embarrassing material when they applied for jobs, but he stressed that it would not give them the right to ask for material such as their police or medical records to be deleted. Newman was quoted in 'EU Proposes "Right to Be Forgotten" by Internet Firms', *BBC News*, 8 March 2012. Available at <http://www.bbc.co.uk/news/technology-16677370> (accessed 12 October 2016).

lie' in which US intelligence agencies denied the extent of their spying on heads of state or their own citizens be protected from disclosure? It is a white lie in that every competent major intelligence agency will know who is spying on whom. It is part of the spy versus spy game; so was Edward Snowden, who revealed some of the public lies, a whistle-blower or a naïve cyber-Utopian disclosing information that intelligence agencies are compelled to reveal internally on an in-confidence basis?

As this brief discussion indicates the reinvention of approaches to source-based approaches to information management is morally charged. Recordkeeping, as a technical activity, on the other hand is morally indifferent, a reality which recordkeeping informatics should never fail to address. Healthy societies depend upon recordkeeping, but so do the diseased ones. George Orwell, in his two classic works, *Animal Farm* and *1984*, pinned down the problems. Technocrats and managers might rely on suppression of people by recordkeeping and engage in double-speak in an attempt to fool most of the people most of the time. Every time people are treated merely as a productive unit, a form of dehumanisation takes place. Today in civil information service management, for example, we have the double-speak of 'client-centered services' and 'citizen-centric government'. The terms seem to emphasise people, but often link the delivery of services to the disclosure of data without informed client or citizen consent. When this happens, power and control are playing out over personal data and people are merely cyphers. Bringing people to the front of the management of our records in ways that are not dehumanising can, however, be fairly threatening in modern organisations, especially for some government organisations. Can government and business organisations overcome the objectification that reducing people to subjects in records has produced? It will be one thing to reinvent source-based documentation methods, but will depersonalised decision-making threaten to make many people collateral damage in various spheres of operation?

6.7 Provenance, Innovation and Moral Defence

When postcustodial archivists began in the 1990s to imagine a world in which archives would be formed and managed in logical fashion without archivists getting their hands on them, they were in a sense twenty years ahead of the game. They could see the clouds forming. The technologies were in place; the people and the agile forms of implementation of those technologies needed to make nanosecond archiving a reality were not.

Terry Cook labeled the Australian strand of postcustodial archival thinking neo-Jenkinsonian, because it took an innovative approach to Jenkinson's moral defence of archives.²⁰ David Bearman's standard seminar joke at the time was popular in Australia – custody was a good idea; someone should implement it. Australians were looking for more systematic methods of guaranteeing the reliability of records, as were archivists in other parts of the world, but the Australian continuum tradition put them into more regular contact with the changing and complex parts of recordkeeping informatics and enabled them to be the country that first produced media-independent recordkeeping standards for records management.

Jenkinson's moral defence argument was a variation of provenance theory and so too was the records management standard, documenting in media-independent fashion how to directly record agents in action during business processes. For Jenkinson, agencies had no reason to do anything other than strive to keep accurate and reliable records and, in Australia until the 1980s, that was a view shared by the Public Service Board and the Commonwealth Archives Office. With the abolition of the Public Service Board, Jenkinson's Pollyanna view collapsed and Australian neo-Jenkinsonian thinking was born.²¹ Now the cascading nature of documentation means that a more systematically managed approach to the integrity of recordkeeping custodial control has to be transferred into business applications.

As was the case with appraisal as part of recordkeeping functionality, we are, however, suggesting the need for genuine innovation and not merely reinvention, so must defer a proper discussion of what can be done until the future of recordkeeping informatics takes more concrete forms. It is a discipline under construction and needs innovative architects and builders who can respond reflexively in the future, whatever that might be. Nevertheless, we can string together some meta-prescriptions governing how that future might look and how it can be built. It will look like someone has taken cloud computing by the scruff of the neck and given it a shake-up so that it pays greater heed to the need for business-acceptable communications and the complexity of storage, appraisal and provenance issues. At present cloud computing is still best summarised as a fragmented array of technical achievements that disturb traditional notions of custody. The applications of recordkeeping informatics will be built by individuals

20 Terry Cook, 'What is Past is Prologue: A History of Archival Ideas Since 1898, and the Future Paradigm Shift', *Archivaria* 43 (1997): 17–63.

21 Sue McKemmish and Frank Upward (eds), *Archival Documents: Providing Accountability through Recordkeeping* (Melbourne: Ancora Press, 1993).

trained to address the genuine and expanding complexity of the relationships between custody and the business activities and have a view of the simpler whole (the archival multiverse) that they share with other informatics professionals.

They will be actors in a network playing their part reflexively. There is no place for perfectionism, other than in data entry for computational reliability. Individuals and groups creating records along with those designing applications need to do the best they can to assess the contingencies involved in the business processes, make the best possible use of the technologies at their disposal, and consider the quality of the evidence that can be captured and how it can be carried over time. The goal is still the production of long-lasting evidence, but the location of that goal within internet-based business applications means that you can always aim to do better within application upgrades. If an application is a flop, plug in a new one that can play within the same business-based enterprise architecture and, if it is deemed advisable, upload the old data or send it off in readable form to a repository. That will be the recordkeeping informatics principle of contingency in operation.

Some problems are hard to contain, however, no matter how much attention is paid to contingencies. Identity management is prime amongst informatics wicked problems and it is spreading out in many directions. Since the centralisation of births, deaths and marriages registration, company registration processes, land-title registration processes and the development of government archives, the government has been the trusted agency for identity and related entitlements. Clearly this needs substantial rethinking in the digital age. Identity management is not simple and is of vital importance to us and links to our rights and obligations as individuals or as organisations. Provenance details also affect our capacity to interpret information resources and to enable or restrict access to those resources. With recordkeeping concerns now transcending the boundaries of the organisation, enabling mobile working for employees, granting greater rights to data subjects whose personal information is in our records, and opening up systems for greater transparent use, provenance is of prime importance to digital recordkeeping. Governments are losing control of the process and, as we argued at the end of the last chapter, the chaos is likely to get worse before it gets better.

Part of the problem is that identity used to be a matter of applying enduring labels to things, but when one shifts to things in motion, perduring approaches are needed and these will need to be innovative. Assigning

a persistent identifier for remembrance purposes across all data ensures that there is a means of checking that the right resource is being referenced, linked and managed, so it is a subject of computational development in protocols such as Friend of a Friend (FOAF), an implemented semantic web enabler, providing navigation through relationships, and a watch needs to be kept on such developments.

As with our discussions of innovation in relation to storage and appraisal, we have confined ourselves here to presenting some meta-prescriptions. Recordkeeping has always been about relationships. For all that, archivists and records managers (and everyone else) have a very undeveloped and superficial understanding of what these relationships will be like in business-acceptable cloud computing. In relation to the moral defence of archives within the custodial chain, our answer to exploring innovative approaches in contained fashion comes back to the business application and its fractalisation. It is within the application that a balance between specificity at monadic levels and the monistic navigational style of meaning at the level of the multiverse can be explored, including which relationships need to persist in perduring fashion and how the relationships can contribute to multiple access paths into the archive. Provenance practices need innovative approaches that arise from studying the complexity of the parts within a hypertext-style network that builds cumulatively.

Part of the innovation that is needed is to break down the separate mind-sets that have been governing storage, appraisal and provenance functions. For recordkeeping informatics they are themselves a semantic web. All three functions need to be integrated within a new approach to recordkeeping functionality. This is a complex task, but not an impossible one if the whole/part (monism/monad) motifs of this book are taken seriously and workplaces can overcome the legacy of the division between records and archives management and the modern non-recordkeeping practices that caused by this division whenever it failed to consider the need for direct relationships between the business process, agents, and the archive.

6.8 Recordkeeping Functionality and the Classification of Semantic Webs

Classification, more than any other recordkeeping function, is contingent. What is being classified? The library's Dewey decimal system was a universal system for classing knowledge across a multiverse of subjects, whereas records management classing systems classed the business activities of an

organisation. The first was designed for the retrieval of books, but also provided a way of filing books in an individual library. The second aimed to provide a way of filing, but also provided a retrieval mechanism. This book offers a fresh perspective on the classification of the semantic webs within which recordkeeping functionality operates, by which we mean it provides a unique way of looking at the development of and change in meanings within groups of words that control the linguistic bundling of our communications and activities as part of the management of things in motion. That uniqueness, from an organisational perspective, involves the deployment of various motifs across three facets of recordkeeping analysis and two building blocks and while this has been outlined in the preface we believe it is necessary to briefly recap the method here because all parts of it are interconnected and recordkeeping functionality if it is to address the access problems set out in the previous chapter needs the fullness of the approach not a few bits of it.

Because it is a new approach, there are elements of it that will not seem everyday to most practitioners with a different past on their backs. As a consequence, there will be a tendency for such readers to want to cherry-pick ideas. To do so, however, would be to underplay just how much effort has been devoted in these pages to creating an agile structure for meaning that matches the need for a discipline that can cope with change and difference. In accord with elementary structuration theory, the structure of a discipline will affect the actions of those who pursue it and the actions will change the structural elements. All of the parts of this book contribute relevant parts to a single-minded approach to recordkeeping functionality, but can also expand in complexity and shift with the applications in particular times and places. In other words, this book's structure is itself a carefully orchestrated classification system for managing things in motion. The appropriate place to cherry-pick and argue about issues is in the expanding details and they have yet to form within workplaces.

Part One of this book set out intellectual and historical grid-maps for the emergence of practices in the future, using an understanding of past trends and a motif-based mechanism for classifying new ideas about provenance within an expanding continuum of recorded information (the direct inscription model linking people, business and the record). The explanations sought to heal some of the divisions that were forged last century, such as those between information management and information systems design and development and archives and records management, and to heal the fracturing within those divisions. It did so by grasping onto an approach

where the convergent whole was a container of expanding complexity, and specialisations like those of the recordkeeping single mind could continue to develop within the diversity of the whole.

This second part has contributed expanding forms of faceted analysis. From an organisational perspective the concept of facets is crucial to the whole, pointing to how, within the complexity of business activities, when you turn a business application over analytically within an agile computing approach, particular facets can assume greater importance than others when they are being focused upon, but then have to be fitted back into the broader analytical web. We have plucked out three facets for special attention – information cultures, business analyses in support of the structuration of and the dissemination of records, and dissemination, a component of access that is causing major problems for those organisations that have weakened their information cultures and their ability to provide for direct activity-based bundling of recorded information during communication and business processes.

The facets of analysis on their own do not make for the successful operation of recordkeeping informatics programs, so, in the course of writing this book, we have had to support our discussion of analytical facets with an exploration of recordkeeping functionality in this chapter, advocating the integration of storage, appraisal and provenance functions as part of a semantic web of change that involves both reinvention and the development of innovative strategies, tactics and structures.

Part Three is continuum-based, providing the transcendental pragmatism that can drive the ongoing development and operation of recordkeeping informatics. The transcendental side – the metaphysical eagle-eyed view – is provided by continuum thinking that within semantic webs can act as a connecting point across the diverse specialisations that will need to work together to maximise the relevance and impact of each specialisation. In the paper era elements of recordkeeping functionality floated off from each other and were separated from records management. They can be drawn back together by spreading an understanding of the existence of an archival multiverse – a simpler whole that encompasses massively expanding complexity. That will not help to manage the part. For that purpose, organisations will need to use recordkeeping metadata as a building block within business applications. It is only within such granularity of control that organisations can hope to rebuild adequate control of the trajectory of records and discover the patterns that can provide the necessary forms of fractalisation needed to economically build an organisation's archive.

6.9 Recordkeeping Informaticians as Auditors

The proof of our recipe will be in the actions. In academic terms, this book is a contribution to the literature of the material semiotics of Actor–Network Theory but its test will not be in its semiotics, which we know are solid, but in its outcomes. The last part of the book starts the process of thinking about how a recordkeeping informatics form of ANT can evolve as part of a broader informatics approach to authoritative information resource management helping to address some of the gaps and absences in the implementation of the wonders of our technologies. In the case of recordkeeping informatics, the hole relates to problems with the direct recording of activities within structures that adequately contribute to the future and document the past. We want to speed up the evolutionary process by which ethically oriented informatics professionals emerge, capable of bearing some comparison with other professions of social significance such as medicine, law and accounting.

For that reason, one of the major motifs in this book is the need to develop monitoring and auditing techniques for recordkeeping informatics. It follows the twenty-year-old lead from the Australian archivist, Glenda Acland that professional archivists should be auditors, not undertakers including [of course] the forensic auditing of past practices. It was a logical proposition in the 1990s, but in the digital era it is an imperative if recordkeeping informatics is to evolve with changing information and communication technologies. Unfortunately, the auditing and monitoring of storage, appraisal and provenance processes was ignored in the paper era, as evidenced by the fact that the archives and records management groups failed to produce a universally transferable recordkeeping audit mechanism. If such a method had been available, the records and archives management disciplinary base might have evolved more rapidly to match the nanosecond archiving requirements of cloud computing.

Apart from keeping practitioners in touch with change, auditing and monitoring roles have their own set of basic tasks to address. A method is needed, for example, to monitor outsourced activities to see if contracts are being observed, whether necessary evidence of activities is being produced, and whether business applications are functioning in accordance with their protocols. Otherwise, both the contractor and the service provider know that their pre-agreements are pyrrhic. In particular, for any organisation or service provider, the intent and the processes of recordkeeping both need to be monitored.

Internal auditing should be one based on integrity as a corporate value, or else the business systems and long term future of the organisation are endangered. Corrupt, criminal, dysfunctional, or otherwise defective organisations will ignore this requirement and accordingly need the stimulus of external audit mechanisms to provide proper surveillance. The business application itself, as a dominant agent in recordkeeping informatics-based Actor–Network Theory, needs monitoring and auditing to assess whether it is still performing its function and what backward and forward compatibility issues will need to be addressed when the inevitable new or upgraded module is plugged into an organisation's informatics architecture.

The auditing and monitoring process can also provide an evolutionary framework for the knowledge and skills needed to manage recorded information about actions within and across organisations. A particular focus will be on fractals. Which routines developed to bundle activities together during business communication processes work best in relation to which subset of business activity tasks? The need for forms of fractalisation that are both innovative and a reinvention of the role of series of records in the paper era grows more urgent by the day. In Australia, it is a daily occurrence to have media reports in which poor or non-existent connections between business activities and records are part of a story of corruption, incompetence, criminality, terror, or failure to curb terrorist actions – and Australia is a country with a good recordkeeping history! We are not saying that the surveillance issues are easy to solve. As we argued in the first part of the book, the wild frontier discussed by Canadian consultant and administrator, John McDonald, is expanding exponentially.²² Criminality and incompetence will thrive, the more information storage is put into the metaphorical clouds without attention to nanosecond archiving issues. The structuration of the records within routines behind and beyond our screens and IOTs is still too much of a non-transparent lottery with too many losers.

In terms of recordkeeping activities there is much to audit. In this chapter we have focused on storage, appraisal and provenance, but underneath these functions there are very concrete techniques for business activity bundling in a world of cascading inscriptions. These have been set out in standards but have yet to receive careful application within enough business applications for those standards to be seen for what they are. They were designed as a guide to managing the complexity of business recordkeeping systems used

22 See Chapter 1 (at 1.1) and Chapter 2 (at 2.4).

across an organisation for the direct recording of all business activities. The recordkeeping processes discussed within records management standards include registration, workflow, work-process analysis, persistent identifiers, the bundling of records captured within communication chains, business classification, storage formats, and vendor management. The recordkeeping system approach did not work, however, because the idea of records falling through into a floor under all business activities was too idealistic. The content of the standards, however, saved the processes from neglect and agile computing provides a realistic implementation scenario in which they are transferable into business activity modules. Without the constant development and renewal of such standards, cloud computing for any organisation will be a risky leap into the wild frontier. This does not mean that for many of them the leap should not be made, but, in relation to any business activity, the dangers need to be included in any risk management assessment.

Until methods for monitoring and auditing recordkeeping informatics are developed, however, cyber-maturity is a false idol. For an organisation cyber-maturity should be assessed more authoritatively than how much use is being made of social media, how much attention is paid to firewalls, or how much is being spent in the information technology budget. It should also relate to whether the direct recording of actions is occurring and whether the spacetime distancing management of that information helps the organisation to survive, maintain socially responsible associations with others, and contribute to everyone's life-chances, including its own. Self-interest and the moral defence of the formation of archives can and should coincide, even if the old strategies by which this co-incidence in the paper era have been collapsing.

The aim is not to use the audit forensically to see what went wrong; it is to use it clinically to try and prevent calamities from happening in the first place. Too often organisations simply do not know that things are going amiss until a crisis occurs, which is a sure sign that they do not pay enough attention to managing things in motion. Even after a crisis occurs as a result of poor recordkeeping, a fortune can be spent trying to spot the causes and still fail to identify obvious failings, as was the case with numerous investigations of the disastrous home insulation scheme in Australia.²³ The Commonwealth government, we suspect, has collectively lost its ability

23 In 2009 the Commonwealth Department of the Environment, Water, Heritage and the Arts was given responsibility for the implementation and administration of the Home Insulation Program. The subsequent deaths of four young men in separate incidents, all contractors installing insulation materials, were instrumental

to bundle activities during communication processes and needs to rethink Weberian forms of administration. If it were able to do so it might begin to realise that the new technologies can be used to set up clinically useful archives that can provide answers before problems arise and turn records and archives management services from a cost centre into a profit centre.

If it is properly monitored and audited, an applications-based approach to recordkeeping functionality will offer a fresh but ethically defensible perspective on informatics. It is not a fleeting topography; it is a logical approach that can begin to be implemented tomorrow and can expand and grow over the next few decades. Records managers and archivists can continue to fiddle around and enter dead-end pathways or they can begin to do something with a meaningful future such as use books like this to help develop their own professional audit methodologies based on recordkeeping functionality.

in the appointment of a Royal Commission to investigate the Program. The Royal Commission's report observed that the Program unnecessarily exposed workers to unacceptable levels of risk and made specific mention of recordkeeping failures.

Part Three

The Building Blocks

Chapter 7

CONTINUUM THINKING AS A BUILDING BLOCK FOR RECORDKEEPING INFORMATICS

7.1 Continuum Thinking and the Perduring Archival Turn

Much of what can be thought of today as summarising continuum thinking was fashioned early in the twentieth century within joint philosophical and scientific explorations of spacetime expansion. A view emerged in which a continuum had great complexity in its parts and many points that blended and merged into each other. It expanded exponentially. It was indivisible, and yet was indefinitely divisible; that is, it was one thing with unlimited and often highly complex facets. It was relative in both special and general ways and could be studied through observation. It sparked evolution and was the generator of greater complexity as one point met another.¹ This chapter will recommence continuum thinking from that scientific age when interdisciplinary approaches were the norm, directing it at the modern exponentially expanding continuum of recorded information at a time of disciplinary fragmentation in information science, on the one hand, and an archival capacity for those fragments to converge, on the other.

To those unsympathetic to the information-based relevance of the origins and nature of continuum-based ideas about the simple whole (the monism) and the expanding complexity of the parts (the monads), this chapter will seem to be presenting Philosophy 101. That view, however, disrespects the capacity of each of the information specialisations to use similar basic

1 Frank Upward, 'The Archival Multiverse and Eddies in the Spacetime Continuum', in Anne Gilliland, Sue McKemmish and Andrew Lau (eds), *Research in The Archival Multiverse* (Clayton, Vic.: Monash University Publishing, 2016).

ideas to generate their own understandings of complexity. Archivists, for example, have generated ideas about spacetime thinking of their own under the guise of records continuum thinking or within analyses of archival descriptive techniques.² Indeed cultural historians have even seen archival metaphysics as the generator of a modern archival turn. Kate Eichorn began a 2008 article on the turn with an opening statement that explains it very simply:

The archive and desktop are already synonymous. Once denoting a material repository of documents governed by an established institution (e.g., a state archive), definitions of the archive continue to loosen. For a new generation of readers and writers, the archive may be known only as a site of virtual storage.³

This is an argument that was first made by continuum archivists in the 1990s (see Part One), with one qualification. They did not expect organisational recordkeeping, the state archives, and authoritative information resource management to be left quite so far behind during the archival turning.

In continuum metaphysics the turn is a perduring one – a shift from notions of an enduring archive to one that is constantly reshaping itself. All organisations, governments, and information professionals will have to adjust to the changing and fluid nature of modern information spaces. They are changing so much that, in the years since postcustodial archivists and Eichorn seemingly pinned down the archival turn as virtual, the desktop is now becoming a less dominant concept as it is replaced by mobile forms of computation. Virtual storage is turning into storage in the clouds, changing our ideas of what is virtual and what is physical. Within the turn, existing distinctions blend, merge, and generate novelty.

Continuum metaphysics as a philosophical specialisation has itself expanded over the last hundred years. The very concept of perduring objects has complexified, so why go back to simple forms of continuum thinking?⁴

2 In Australia continuum thinking is personified in the works of Sue McKemmish and Frank Upward, while the most metaphysical of approaches to archival description since Peter Scott has been presented by Chris Hurley (<http://www.descriptionguy.com>).

3 Kate Eichorn, 'Archival Genres: Gathering Texts and Reading Spaces', *Invisible Culture* 12 (2008). Available at <http://ivc.lib.rochester.edu/archival-genres-gathering-texts-and-reading-spaces/> (accessed 12 October 2016).

4 Michael Loux, *Metaphysics: A Contemporary Introduction* (New York: Routledge, 1998) provides an overview of perduring objects that has informed this chapter and would make a nice point of comparison for any research student wanting to explore the metaphysics in Hurley's approach to archival description.

The argument of this chapter is precisely that the relationship between the overview, on the one hand, and complexity, on the other, can give coherence to and continuing expansion of today's information specialisations. They all have to turn in their own ways. One premise underpinning this chapter is that all informatics professionals can benefit from continuum thinking at elementary levels as a way of opening up conversations about spacetime distancing processes across their specialisation. It is within each specialisation that complex views can be fashioned and carried back into interdisciplinary projects involving an array of specialisations. In such projects, if they are recordkeeping informatics aware, the focus will be on the complexity of nanosecond archiving processes and of business applications directed at the management of cascading inscriptions.

Within the simplifying spirit of Philosophy 101, it can be argued that, in this first period of solidly networked continuum thinking, science had emerged as the dominant mode of knowledge formation. Continuum metaphysicians were spread across many disciplines, including theistic studies where continuum thinking offered the prospect of aligning science with the notion of a deity. The new scientists developed scientific methods for thinking about spacetime and, in doing so, were building upon a host of major intellectual currents from the previous century that addressed the expansion of complexity, including (very famously) Kant's transcendental approach to rational frameworks, Darwin's view of evolution in the natural sciences, and Marx's meta-narrative about the development of capitalism.

Continuum metaphysics was high on the intellectual agenda, particularly as a way of studying things in motion. Einstein theorised that $E=MC^2$, a theory that was to turn the expansionary flicker in spacetime thinking into weapons of mass destruction. The expatriate Australian Samuel Alexander, who at the time was lionised along with Einstein,⁵ wrote a book on spacetime and the concept of deity drawing heavily on developments in chemistry, in particular, to argue that we are all on stage in a theatre of perpetual movement.⁶ Alexander's book was full of sage advice, such as, when studying ants do not forget to study what happens when you poke their nest with a stick – advice that should be banal, but was clearly something that the US, British and Australian governments overlooked when they led

5 For an account demonstrating the lionisation of Alexander, see *Australian Dictionary of Biography*, Volume 7, 1891–1939 (Melbourne: Melbourne University Press, 1979), 33–34.

6 Samuel Alexander, *Space-Time and Deity, The Gifford Lectures at Glasgow 1916–1918* (Macmillan, 1920).

the invasion of Iraq in 2003. Continuum thinkers like Alexander take a perduring perspective on things, thinking about how they stretch into new times and spaces. Non-continuum thinkers are more likely to think of enduring objects. Mistakes like the invasion of Iraq, however, are reviving the popularity of the Alexander perspective. If politicians (and managers of most organisations) want to manage things in a sustainable fashion they will have to commit to a perduring version of the archival turn, making a better job of using records to assist in anticipating the possible spacetime trajectories of the consequences of their actions. That, of course, is too simple an argument, and to be meaningful will require different specialisations to get to work developing their own archival turnings.

Apart from the basics of thinking about the kinetic energy of things in motion, another element of continuum thinking that remains as relevant as it did a hundred years ago is the ‘simplexity’⁷ of the whole–part relationship. Views of the interconnected relationship between the simpler whole and the complexity of the parts were forged in the seminal works of Gabriel Tarde, Henri Bergson, A.N. Whitehead and Samuel Alexander. William James coined the term ‘multiverse’ to describe the simpler whole, arguing that, without religion, the complex parts were plastic and morally indifferent.⁸ Something similar went on in recordkeeping in which, in English archival theory, for example, continuous custody was needed for the moral defence of the record. The multiverse is again a living word, catching on within recent ideas in quantum physics, cosmology, philosophy and archival theory. It is a monism. As Whitehead put it, everything enters into the constitution of everything else. Tarde had a similar view of the monism that was the multiverse, but took social theorists like Auguste Comte to task for expounding positivist theories of knowledge while conveniently looking away from the messy complexity of the parts.⁹

In the history of French philosophy, Tarde’s contribution has been overshadowed by his successor at the Collège de France, Henri Bergson, and the inheritors of his thinking about flickers in spacetime. Bergson’s religious positioning in the debate with science undoubtedly endeared him to William James and Samuel Alexander. Later descendants (of sorts)

7 There is even a *Wikipedia* entry for the neologism ‘simplexity’, which distils the relationship between the monistic whole and the parts.

8 Upward, ‘The Archival Multiverse and Eddies in the Spacetime Continuum’,

9 Bruno Latour, ‘Gabriel Tarde and the End of the Social’, in Patrick Joyce (ed.), *The Social in Question, New Bearings in History and the Social Sciences* (London: Routledge, 2012), 117–132.

included Gilles Deleuze, Jacques Derrida, Jean-François Lyotard and Michel Foucault.¹⁰ Their impact in North America in the 1980s and 1990s helped create an academic publishing industry discussing postmodernity. Archivists have not escaped their influence, which is not surprising given the focus in French postmodernity on the way the past is always remaking itself and repressing us. Deleuze was fascinated by the study of the cinematic flickering and evolutionary interconnections between past, present and future moments. Derrida wrote a book on archive fever. Lyotard described postmodernity as the *post-modo* (the future anterior) in which information was supplanting science as the dominant mode of knowledge formation. Foucault, whom Deleuze called the new archivist, gave philosophies of cognition an archival turn within archaeologies and genealogies of knowledge. In these and many other ways they explored the perduring nature of the flickering archive. They did not undergo an archival turn; they were already turned well before digital archives.

The perduring turn is starting to catch on in government decision-making at international levels as political and intelligence analysts explore the mess that Western powers have helped create in the Middle East. It has yet to catch fire in organisational business records management as part of information management or in the design and implementation of business applications within information systems design and development. Internet-based business applications are beginning to be built using methods that pay closer attention to nanosecond archiving and flexible application architectures, but it is a shift in thinking that is only in its infancy.

There are two strong parallels with spacetime thinking from a century ago that might help persuade organisations to begin to address the growing gap between the management of change and the lack of informatics-based perduring perspectives within the recording of business activities. First, there is the need to focus on cascading inscriptions and the management of things in motion. Future informatics professionals will find themselves with an accelerating need to manage information objects as they stretch into and mutate within new information spaces. Perduring business applications set up a need for modular applications that can be tailored for particular times and places and superseded by new modules that are plugged into the information and business architectures with respect for backward and forward data compatibility. At present one can see the technique at work in

10 Foucault made sure that his protégés and colleagues, including Deleuze and Derrida, read Henri Bergson, who was one of the authors of philosophies of emergence in an era early in the twentieth century.

the availability of basic communication apparatus within application stores. New apps can be drawn down to replace old ones, but as more robust business applications develop, existing app stores will look like Felix the Cat cartoons from the 1920s when compared with modern forms of animation. They are primitive tools for business purposes, but signs of things to come.

Second, there will be a need to rethink the relationships between the monism (the archival multiverse) and the monads (the minute details that can cause even well thought out plans to go wrong). Cloud computing will force a consideration of both the need for perduring applications and the need for more adequate whole-part relationships as objects move into multiple information spaces with varying degrees of control and with so much non-transparent and often unaccountable action occurring behind and beyond our communication and computing devices.

History as a story of expanding complexity can never repeat itself. It does, however, provide examples of parallel universes and there are now many parallels between scientific thought from a hundred years ago and the sort of thinking in information science that will be needed in this century if organisations are going to more adequately come to terms with the expanding continuum of recorded information.

7.2 Continuum Mechanics

Anglophonic information disciplines have been colonised for more than half a century by end-product versions of lifecycle models. Records grow old and become archives. Systems grow old and atrophy. It is easy to see continuum thinking as a variant of such thinking and hold out the possibility that enduring paradigms can absorb perduring ones within discursive and non-discursive practices. The real differences between management-based end-product lifecycle models and continuum paradigms are revealed, however, when the microscope is put onto the significance of continuum mechanics as a way of managing ongoing structural stress. Continuum mechanics in this pragmatic guise refers to the way architects have taken into account spacetime factors when designing structures to withstand the stresses of change, be they anticipated deterioration over time (in continuum thinking atrophy is a constant issue, just as it is in lifecycle thinking), the buffeting of freak weather conditions, or even being hit by an aeroplane. Architects could shrug their shoulders and simply say that the structure has a finite lifecycle and will reach an end of its use in some point in time. If so, things can go unnecessarily wrong as they did in 2001 when planes hit the twin towers in

New York or in 1974 when Cyclone Tracy flattened Darwin. In both cases, one fundamental lesson learned was that the continuum mechanics of the building design and construction processes were inadequate.

When there are information-based disasters, such as the invasion of Iraq in 2003 or the ignoring of climate change, one of the first thoughts should be was the archive formed in adequate ways, whether it is an intelligence database or a global archive of climate data? For organisations, the point to question is the mechanics of separating information architectures, enterprise architectures and business architectures. There is increasingly a need to spread the stress within the relationships between information management, enterprise management and the actual day-to-day business activities. The marriage of internet and web-browser technologies in the early 1990s changed both information management and information systems design and development principles and practices and provided a concrete information-based example of the simple idea in continuum thinking that everything in some way is involved in the composition of everything else.

Continuum mechanics for information architects presents even more complex problems than those faced by building architects. In this book the focus for innovation, first and foremost, has been the image of the web, whether in terms of the web of relationships that produce records, the semantic webs in which we operate, or the whole–part simplicity of the World Wide Web, which presents a deceptively simple whole but has great complexity in its parts, including its modern business applications. A continuum has many points that blend and merge into each other, and is constantly recharging the world in minute details within its evolutionary flicker. Stable models like lifecycle ones might be useful for management or design purposes in particular projects or places, but they are dysfunctional if they take attention away from flux-based realities. The continuum paradigm is different, and its perduring modality is needed to manage things in motion – a need that is becoming greater by the day.

From the outset the hypertext element of the World Wide Web promoted technical discussions about the problems of loss of information and the need for adequate nanosecond archiving processes. As we argued in the chapter on recordkeeping functionality, it was based on a document paradigm and has only now begun to more fully accept the challenge of addressing the loss of provenance details within cascading inscriptions.¹¹

11 For the document at the centre of the construction of a hypertext approach, see Tim Berners-Lee, 'Information Management: A Proposal, March 1989, May 1990', available at <http://www.w3.org/History/1989/proposal.html> (accessed 12 October

Details connected to the direct recording of agents going about their activities within business activities, or nanosecond archiving as we are calling it in this book, need to be addressed not only at the hypertext level but at the level of the complexity of the parts. In particular, there has been a lack of innovation in the evolution of authoritative information resource management within cloud computing, the child of the marriage between web and internet technologies. Many archivists, records managers and representatives of other information specialisations have opted for end-product paradigms, but managing inscriptions in motion requires a shift in thinking to perduring paradigms.

Simply understanding the need for perduring approaches will not help if the people and the technologies cannot deliver adequate outcomes. In the 1990s when postcustodial continuum thinking began to emerge in the archival profession in relation to electronic records management, the theory of using recordkeeping metadata that underpinned it (see Chapter 8) was logical, but the means of coherent and practical forms of implementation were not at hand. Within the leviathan and structural forms of systems analysis that dominated the era it was always going to be difficult to maintain the archival trail, establish new means of bundling activities during the direct recording of business processes, and keep the values of authoritative information resource management alive and well. The expanding continuum of recorded information could, however, be managed by shoveling information into vulnerable storage receptacles and subjecting the vast data stores to the expanding power of information retrieval. Even in relation to storing communications, it is much easier for Google or Microsoft to throw another server on the chain than for organisations to work out in more granular fashion how to form useful and usable archives. The problem is that the easy options have obvious and powerful uses but, as we argued in Chapter 5, have created very large quantities of vulnerable digital memory and have not helped enough in separating out the good oil from the information sludge.

We are not creating an either/or argument here and those that want to turn what we are writing into a debate between big and small data or lifecycle and continuum thinking are probably more in need of a Philosophy 101 course on continuum thinking than most people. There is a greater need than ever before to arrive at adequate accommodations between enduring and perduring paradigms. We are pointing to a major absence, not arguing

2016); for a discussion of provenance issues from a technical perspective, see *Provenance XG Final Report: W3C Incubator Group Report 08 December 2010*, available at <http://www.w3.org/2005/Incubator/prov/XGR-prov-20101214/> (accessed 12 October 2016).

against any particular presences. That said, the knowledge in this book is predominantly controlled by the continuum paradigm and, while other knowledge is needed, there are times when ignoring the perduring perspective can take archivists up dead ends. When, for example, is there a need to capture fixed records? In structural or leviathan information systems the question tended to be addressed in holistic fashion. If the record was not fixed, it was not an archival record. So much of the initial archival response to electronic communication processes involved preservation formats and looking for ways to mimic the fixity of the paper record.

One of the most illustrative examples of the sort of dead end the idea of fixity can lead to is a poster distributed by Australian Archives in the 1990s. It had an elephant on it and urged agencies that if they wanted to remember what had happened they should think ‘Want It, Keep It, Print it, File it’. The printing would, of course, be on archival quality paper. Amongst archives and records students and staff at Monash University it quickly became known as the Wikipifi strategy. Fixity of the individual object can matter in some systems and applications, but to associate that with the storage of memory was going against every trend in computation. It accentuated a looking away from the real emerging problem, the fluidity of memory as a record of things in motion, which to think about required a switch to perduring paradigms. Electronic recordkeeping clearly made too many archival brains hurt in the 1990s as they struggled to come to terms with leviathan approaches to systems design and data storage, but as we argue through this book, that was then. Modern agile forms of computation are much more compatible. Want it. Keep It. Build or Select an Adequate Business Application. Use applications with a four-star or better archival rating, of course, not that a rating system exists yet.

That is a brief encapsulation of a major strategy set out at both monistic and monadic levels in this book, but a new problem for continuum mechanics is how to transfer into internet-based business applications both the convergence of information specialisations and the detailed knowledge each specialisation can contribute. Just as continuum mechanics for architects needs a project focus to produce outcomes, information architects need to take a similar project-focused approach if the complexities of cascading inscriptions are to be managed adequately. In the next few sections of this chapter we will present a range of models based on an information-processing continuum of ‘create, capture, organise and pluralise’, a perduring continuum first modeled in the mid 1990s. Many different minds have to come together within business application design

projects, and simple logical explanations are needed to help put project team members on the same wavelength in relation to authoritative forms of information resource management. The models that will be presented cover the processes of recordkeeping, information management, publishing, cultural heritage, information systems design and digital forensics, and the common wavelength is that they share a rhythm based on the information processing continuum. The models are graphically weak, but within them the beat of the four dimensions is strong.

The presentation will begin with a records continuum model (RCM). The description of it will be brief; all the other models will also be described briefly. Both the graphic weakness and the brevity are deliberate. Each specialisation has its own stories to tell and its own skills and knowledge to explore at the level of detail and the models only wave generally in this direction. Detailed explanations, on the other hand, might take design projects off into interminable debates between different specialisations about words that they mean different things by anyway. A business application focus, especially within design projects, is needed to make the models dance.

7.3 Recordkeeping Informatics and the Records Continuum Model

The first of the models to be presented in this chapter is the home base for recordkeeping informatics, the records continuum model (Figure 7.1). It was published in 1996 and has turned out to provide a stable information processing continuum template for a range of models.¹² The Australian archivist, Michael Piggott, has said that no matter what you think of the model, archival theory will never be the same again. In continuum theory it should never be the same in different times and places anyway. That is the point of taking a perduring approach to informatics. The model takes the notion of evolution seriously and provides an explanatory umbrella for

12 The model was developed by Frank Upward, who fiddled around with the arrangement of points and engaged in collegial discussions with Sue Mckemmish, Livia Iacovino and Barbara Reed. Somehow or other, within that process many connections were made with deeper reaches of continuum theory. The only conscious ones in the mind of the designer was Alexander's perpetual movement and the four dimensions of Minkowski's spacetime continuum. For research students looking for source-based inspiration, however, there are echoes of Einstein's positions of observation, John Dewey's emphasis on transactionality as a generator of evolutionary developments, various postmodern explorations of archival time, and sociological theories of emergence, particularly Anthony Giddens' structuration theory, which was later used as an explanatory tool.

many different practices in many different places.¹³ Alternatively, it irrevocably changes archival theory in that it makes it difficult to argue against the proposition that the division between archives and records management that dominated a lot of anglophonic archival theory in the last half of the twentieth century has any logical depth to it other than how practical it might have been in simpler times.

The model's essence can be found in its perduring dimensions of creation, capture, organisation and pluralisation, and, in part, its development was directed at helping students think about how to recapture that dimensionality in new ways within the archiving of electronic communications. When it comes to capturing authoritative records, building an archive for future use, and managing an archival multiverse built upon the electronic storage of memory, an evolving and perduring approach is needed. For digital recordkeeping, for example, archival control has to be caught up in the flow of communications.

As already mentioned, the model is graphically feeble. It is too stationary, for example. Its logical nature, however, struck a chord. Its game-changing nature can be seen in a quote from the blog of James Lappin, who has used the model to urge that links be formed between MoReq2010 and the OAIS models for records and archives management respectively:

The interest of wider society in the records of any particular event do not suddenly materialise 20 or 30 years after an event. The interest of society is present before the event even happens. A records system of some sort needs to be in place before the event happens in order for the participants/observers of the event to be able to capture a record of it. That system needs to take into account the interest of wider society in the event in order for the records to have a fighting chance of reaching interested parties from wider society if and when they have the right to access them. This concern is particularly pertinent to digital records...[which] are at risk of loss if they, and the applications that they are held within, are not actively maintained.¹⁴

13 Michael Piggott, *Archives and Societal Provenance: Australian Essays* (Witney: Chandos Publishing, 2012), 178–180.

14 James Lappin, 'Why a Link Between MoReq2010 and the OAIS Model Would Benefit Both Records Managers and Archivists', post to his *Thinking Records* blog, 13 July 2012. Available at <https://thinkingrecords.co.uk/2012/07/13/why-a-link-between-moreq2010-and-the-oais-model-would-benefit-both-records-managers-and-archivists/> (accessed 12 October 2016).

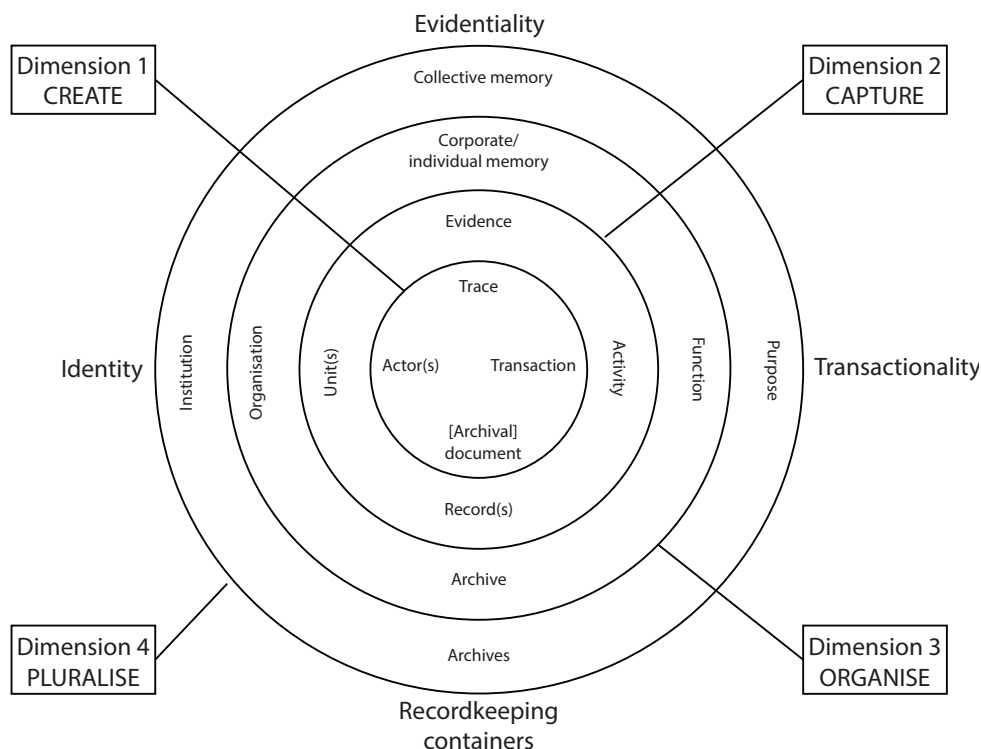


Figure 7.1 The Records Continuum (RCM)

Explaining the model can be a lengthy process if one concentrates on the naming of parts. In this chapter the explanations will be minimal, as more detailed explanations are available elsewhere.¹⁵ Here, the hope is that enough meaning will be distilled so that readers can begin to use it and other models within projects and begin to understand how it might be used for a future web of archivally approved internet-based business applications made available from an applications store.

While the model might seem radical because it rejects the logic of the common division between archives and records management tasks, it is conservative in the neo-Jenkinsonian sense explained in Part One of this book. It provides a way of explaining the moral defence of the record that focuses on the integrity of the record and what might be needed to give

15 Sue McKemmish, Barbara Reed and Frank Upward, 'The Records Continuum Model', in M. Bates and M. Mack (eds), *Encyclopedia of Library and Information Sciences*, 3rd ed. (New York: Taylor & Francis, 2009), 4447–4459.

effect to authoritative forms of information resource management. It is, however, radical in terms of its use of the aforementioned parallels between the scientific challenges of studying things in motion a hundred years ago and the need to now do the same thing in information management and systems design and development. The information processing dimensions mimic Hermann Minkowski's four dimensions of spacetime. The kinetic energy of Minkowski's view turned out to be dangerous in the hands of nuclear physicists. It is not hard to envision the horrors in the parallel information universe if a totalitarian government got the creation, capture, organisation and pluralisation of spacetime distancing processes in tune with repressive goals. It is the role of the moral defence of the way we capture records and form an archive to get the record and its provenance trail straight and, thereby, give societies some chance of developing sustainable and ethical futures.

Understanding the moral purpose of the model still leaves the problem of understanding the points represented in it. Here the basic project advice is not to pin down the meanings too precisely other than in the project itself. In theory, the more detailed and communicable the exposition of the points becomes, the more restrictive the use of the model will be as a template for designing, implementing and monitoring business applications or reviewing actual situations. Project teams often will need to define terms in the system metadata accompanying an application or systems. The meanings are not universal. A continuum is constituted by points that blur into each other. Meanings are part of a semantic web that shifts and changes in different times and places and that is true of all the points in Figure 7.1.

This degree of flexibility tends to go against past practices. Archivists and records managers have spent a lot of time over the years trying to pin down words like document, record, archive and archives. In practice, if the points have to be explained, the explanations should be couched in perduring form helping students and practitioners accept that such words blur into each other within a semantic web. One way of doing this is simply to present a cavalcade of definitions from different times and places. Even in this book we have shifted away from using one of the terms in this model, the (archival) document and have started to use the word inscription. The words are synonyms, but 'inscription' is more graphic in relation to modern forms of digital communication with its emphasis upon messaging. Archivists in the 1990s similarly set out enduring definitions of a record within the spirit of producing something recognisable in all times and places as an

electronic record, but their definitions were different from those from the paper era.¹⁶ It also helps to get a perduring perspective if all the points on the recordkeeping axis are thought of as gerunds. To record is a process, as is to document and to archive. Recordkeeping processes will produce objects, the nature of which, as we argued above, is best defined within the application.

That does not mean that the terms are meaningless outside a particular application, but the axes in the models as vectors will push and pull our definitions in directions determined by the contingencies of that application. In Figure 7.1 there are four axes, each of which often acts as a vector and has points that blur into each other and into many other unexpressed synonyms. Each contributes to the moral defence of the record. The evidentiality axis, for example, draws attention to the quality of the record, the usefulness of the archive, and how to manage the plurality of the archival multiverse. The identity axis is a reminder of the importance of observation points, setting up individual, group, organisational and institutionalised perspectives about records and archives as well as providing for multiple provenance. The transactionality axis ties the recorded information in with the things we do. From previous teaching experience, that is probably enough of an explanation of the vectors for project team members to begin to use the model and to work out what the points mean in relation to their task.¹⁷

The dimensions, create, capture, organise and pluralise, need more attention as they need to be explained logically as a recurring pattern within both information management (IM) and information systems design and development (ISD). Three major forms of explanation of the dimensions have emerged from classroom use. First the dimensions provide spacetime distancing perspectives. This was formularised in Chapter 4 as P_R_A_A ∞ . The connections between the performance, its recording, its archiving and

16 Simply presenting many definitions will illustrate the shifts and changes. The word 'record', for example, served the English language well for many centuries as a way of distinguishing documents that from the outset were brought into being for the purposes of the evidential task of time-space distancing. It was associated with information objects like rolls and registers that were specifically meant to carry information across time. The Doomsday book, for example, with its details about the population of England was more than a document. It was meant from the outset to be a time-space distancing tool. Now that meaning of a record, while seldom completely lost, has been twisted and reshaped in many different directions.

17 Frank Upward and Sue McKemmish, 'Teaching Recordkeeping and Archiving Continuum Style', *Archival Science* 6 (2006): 219–230.

its positioning in the archival multiverse were used as a way of classifying recordkeeping processes involved in the structuration of records. In order to bundle activities within communication and business processes, you need to combine information management, systems design, and those components of recordkeeping functionality that impact upon access (discussed in Chapter 6 under the terms storage, appraisal and provenance) within nanosecond archiving processes.

A second form of explaining the dimensions can be raised during projects or within teaching and training programs by asking whether the circles are needed in the models. If they really are continuum models, surely the dimensions blur into each other like the points. The circles suggest boundaries and thus reinforce the non-continuum notion that there are boundaries between records management (the first two dimensions of the model) and archival administration (the third and fourth dimensions). In practice in the paper era, those boundaries have been real and their legacy lingers on. For this reason the lines are needed but to shift from topographical to topological thinking imagine that the lines represent thresholds that might or might not be crossed within the recordkeeping processes of a particular project. In modern internet-based business application projects one can assess what thresholds, if any, need to be crossed and what needs to be constructed on the other side of the threshold. This can be done before inscriptions begin to be managed. Within nanosecond archiving the ideal is for thresholds to be crossed instantly, but it will not be a universal crossing for all applications. Where to draw boundaries or cross thresholds is contingent on the analysis that underpins the design of individual applications.

The third form of explanation of the dimensions follows on from the other two. The four dimensions are the whole, the archival multiverse as it is beginning to be called. Within projects this transcendental concept can be given down-to-earth considerations. Continuum thinking is at its most useful when it is also directed at outcomes, and for this to occur adequately the complexity of the parts can be addressed within the application. Records continuum ideas in Australia have always been transcendental and pragmatic and the models in this chapter reflect this fact. Each model touches upon a wealth of literature, which can make a continuum approach look extremely complex, but the complexities can be sorted out within applications. Information-based business systems analysts can run away from complexity or they can buckle down and sort through it, while looking for patterns that will make future projects more manageable.

7.4 Community Informatics and Models for Information Management, Publishing and Cultural Heritage

The RCM because of its pragmatic element can provide a professional lift to the thinking of practising records managers and archivists. The theory of spacetime distancing within its dimensionality can help give them a place in the charge towards the storage of electronic memory. The recordkeeping single mind, however, has to work with other minds, including and especially with information management and information systems design and development minds. In this section we will look at models for information management, cultural heritage and publishing processes. Again the explanations of the models will be slight and will be directed only at trying to make them dance within projects. None of the various points in the models have hidden meanings that require any basic explanation other than what will be found in a dictionary of the English language. Those deeper meanings belong to the application, not the general explanation. Looking at the points on the page in their flat form is much less valuable than trying to experience their utility or otherwise within projects directed at particular tasks.

All three models in their academic provenance can be associated with community informatics, although that does not mean the organisational focus of this book will disappear. The same models for a social view of a community are relevant to an organisation's own view of informatics and not just because an organisation is a form of community in its own right with its own information culture like any other community. The Monash Centre for Social and Organisational Informatics has been particularly active in the areas of indigenous archives, the informatics of technically disadvantaged communities, the archival multiverse, and explorations of multiple views of records to include co-creatorship perspectives that in the past were often absent from archival theory and practice.¹⁸ Community informatics is a pliable area of study in a range of disciplines. In information studies it addresses community archiving processes in which the continuum aims of trying to ensure that everything can enter into the constitution of the whole and that the parts can handle complexity are not merely idle rhetoric.

18 This is discussed in Frank Upward, Sue McKemmish and Barbara Reed, 'Archivists and Changing Social and Information Spaces: A Continuum Approach to Recordkeeping and Archiving in Online Cultures', *Archivaria* 72 (2011): 197–237.

The first model we are categorising here as related directly to a community informatics based form of information management is the information continuum model (ICM) (Figure 7.2). It was designed in 1996 by Barbara Reed, Don Schauder and Frank Upward, shortly after the finalisation of the RCM. Like that model it was developed as the representation of the continuum paradigm for use in information management teaching and research programs. Its presence in a suite of models highlights that while the records continuum model might be the home base for recordkeeping informatics, it is contained within a much wider continuum of recorded information.

The ICM is not an after-thought. Its construction immediately after the construction of the RCM shows how important it was considered to be as a supermodel for information continuum thinking. The RCM is grounded in authoritative resource management and has more relevance to some projects than others. In digital recordkeeping it is particularly useful for thinking about behind and beyond the screen information storage issues. The ICM, on the other hand, focuses upon production (that is, allocative resource management) and will always be relevant. In any business application there will be a need to develop protocols for the categorisation of action, the structures for action, and the strengths and weaknesses of stored memory, while trying to maximise the effective and efficient use of available technologies. The production processes also have to consider the thresholds and boundaries involved in the dimensions of creation, capture, organisation and pluralisation.

The fact that the two models share common dimensions means that when discussing them within projects it is possible for an authoritative recordkeeping mind (for example, the recordkeeping specialists Reed and Upward) to share a common base for discussions with a more allocatively attuned information management mind (for example, the former librarian Don Schauder), providing the minds respect each other's specialisations and have some understanding of them.

In the ICM, the spacetime distancing processes of creation, capture, organisation and pluralisation operate within sets of vectors directed at outcomes which librarians in the paper era were more likely to have to manage than archivists and records managers including:

- the power of information (e.g. the importance of information to business actions and their interaction with business structures),

- the universalising ways we store recorded information in memorable forms (e.g. the library emphasis upon storing and retrieving books in systems like the Dewey decimal system),
- the way we categorise information across fields of knowledge, (e.g. within particular subject thesauri and classing schemes), and
- the technologies we are using (which is a universal consideration in all forms of information production).

In other words, the model points to, but does not temporally restrict, the discussion of many factors involved in allocative resource management. From a recordkeeping perspective, it also points to many potential metadata elements (see Chapter 8) that within a particular project might be of use when maintaining an archival trail of information resource management elements that can be retrieved along with the information object. The utility of those elements will, however, depend upon the archival needs of the project or task, and not upon the universalising concerns of the librarian.

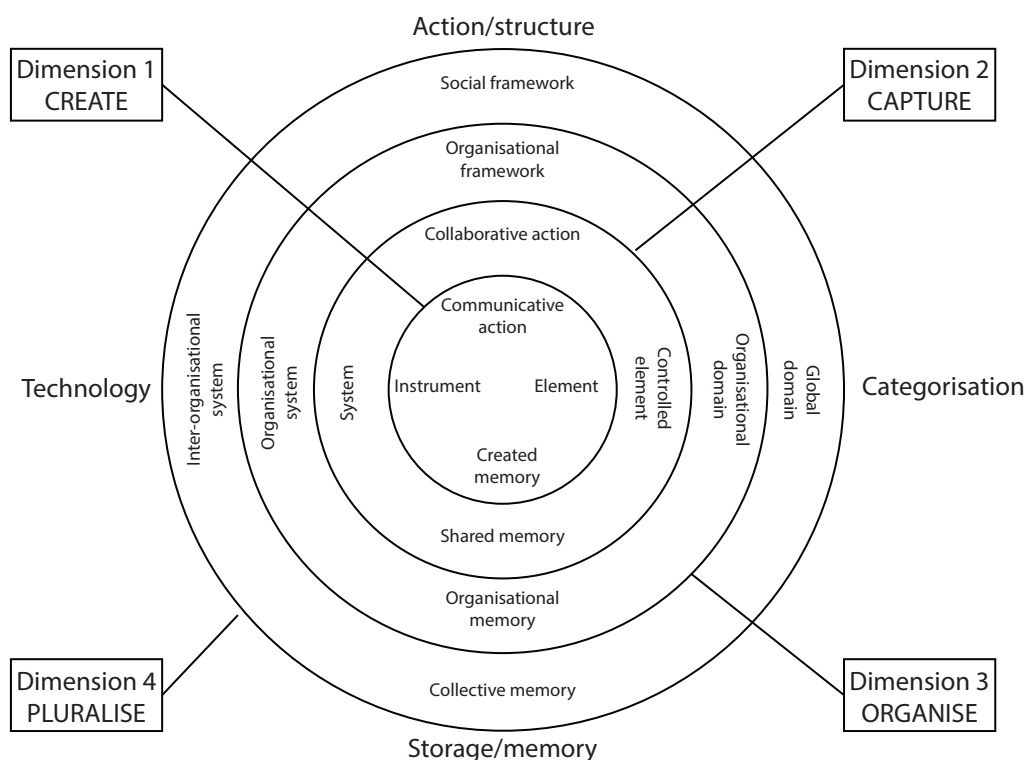


Figure 7.2 The Information Continuum (ICM)

Schauder also shared Upward's interest in interactive forms of sociology, including Anthony Giddens' theories about allocative and authoritative information resource management. The two transferred their interest into a publishing continuum model (PCM) (Figure 7.3). The PCM, in traditional terms, is a joint library and archive continuum model directed at both conscious and unconscious processes of access.

Access in information management tends to be a broad umbrella term and librarians and archivists can mean different things under that umbrella. In this book, for example, the topic of access was split into two chapters, one covering dissemination and the other covering the recordkeeping functionality of storage, appraisal and preservation, whereas librarians get down more directly into the retrieving of the information object. Both groups, however, have to cope with authorial intent. The librarian traditionally has wanted to maximise access and once dealt mainly with things designed to reach the public. Their goal has been to maximise access by putting content first. In the paper era they ran reference rooms and now they also run digital reference rooms. In the paper era archivists ran search rooms working with regulated forms of access to material not initially designed to be in public spaces. They put context first, aspiring to present relevant source and transmission (that is, provenance) information when documents were being accessed. It is, of course, a question of balance and both groups have always wanted to maximise access and present quality information but their core access roles have been changing and converging within variants of the archival (perduring) turn. As we saw in Chapter 5, the archivist's secure and normalised view of access might have been safe in the paper era, but in the digital age the vulnerability of the electronic storage of memory has maximised access in unexpected ways, creating new search rooms like WikiLeaks. For librarians, the most powerful reference room is now the internet but most cultural historians would consider this to be an archive.

The question behind the construction of the PCM, then, was whether it was possible to construct a topological model covering a range of librarianship and archival views of access in different places and times. If you are publishing a book or a blog you would want to have as wide a reach as possible. If you are creating a business inscription you might only want those with a need to see it to have access, but you would also have to consider that it might be immediately accessible under Freedom of Information laws or down the track under archival legislation. Every information systems design

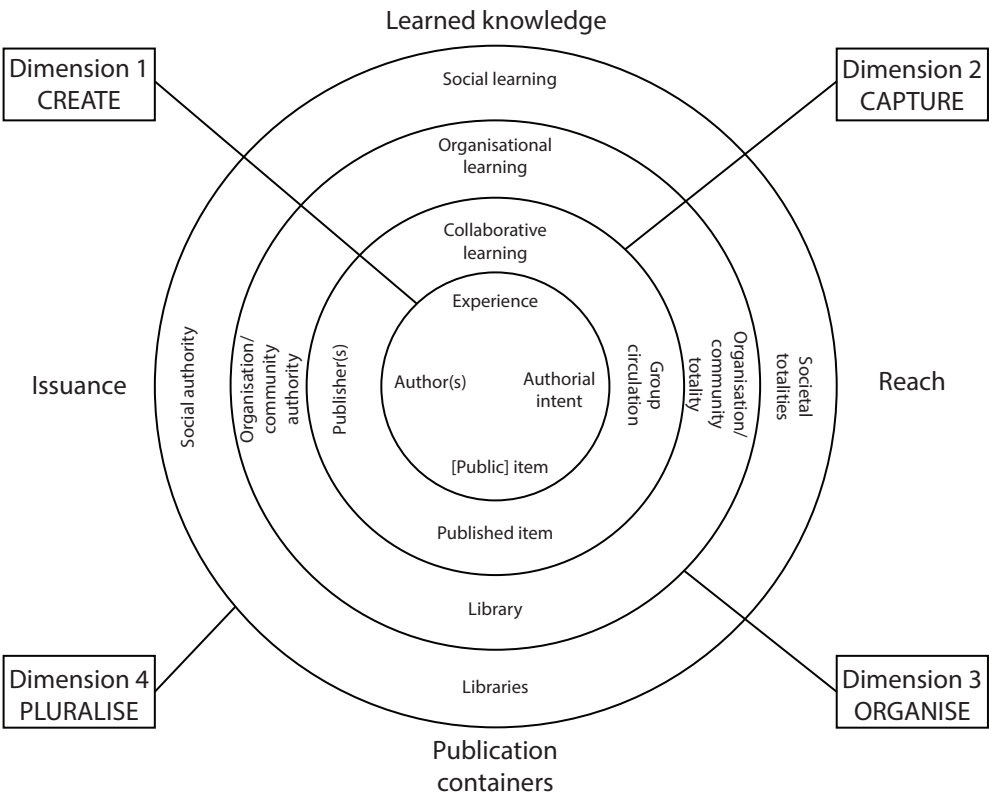


Figure 7.3 The Publishing Continuum (PCM)

project should consider the vectors in this model, simply because they relate to such very basic intended and unplanned levels of access for information objects and because access matters socially and to the testing and extension of knowledge. The issues it raises can be relevant to all internet-based business applications and will always be relevant to information management projects by directing attention towards outcomes related to how information is converted into public knowledge.

In pre-digital convergence terms, the PCM is a librarianship model, but words like library (which it uses) should, of course, be read as a logical container for published items in any time and place and not just a particular manifestation. This parallels the generic use of the word archives in the RCM. Across the processes of creation, capture, organisation and pluralisation, outcomes from making things more widely known will include learning from experience, attaining suitable levels of public reach for a communication, the possibility of attaching details of issuance to information

objects, and how the publication is contained within institutionalised formats as an item and beyond. All these are traditional concerns of librarians, but the model provides proof that in a post-convergence world it is possible to develop a single model for access that different specialisations can work within without losing the capacity of each specialisation to expand their own complexities and concerns.

The final model being briefly presented in this section was something of an after-thought inspired by discussions between the Canadian archivist Terry Cook and Frank Upward.¹⁹ The resulting cultural heritage continuum model (CHCM) is presented here as Figure 7.4. Can a model knit together in coherent but expansionary form the archivist's cultural heritage interests and an organisational view of their information culture? Archivists have always had a tendency to separate their cultural heritage role from their recordkeeping role but Cook's distrust of allocative forms of information resource management – he feared archival institutions might become a 'McDonald's world of information'²⁰ – made him more alert than most North American archivists to what was going on within the academic strand of Australian records continuum thinking.

Culture, continuum fashion, enters into the constitution of everything. It was only when community informatics first entered the picture within research projects at Monash University, however, that ideas that connect cultural heritage and information cultures began to form academically in ways that brought together information management and information systems design concerns. A model that relates to forming the stories we tell and how such stories build and affirm cultures is becoming easier to understand. It has proven to have many uses and thanks to the work of a former research student at Monash, Leisa Gibbons, on the archiving of social media, it might ultimately expand thinking about the archival turn in more innovative ways than the other models.²¹

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- 19 Terry Cook, 'Beyond the Screen: The Records Continuum and Archival Cultural Heritage', in Lucy Burrows (ed.), *Beyond the Screen: Capturing Corporate and Social Memory* (Melbourne: Australian Society of Archivists, 2000), 8–21.
 - 20 Terry Cook 'Viewing the World Upside Down: Reflections on the Theoretical Underpinnings of Archival Public Programming', *Archivaria* 31 (1990/91): 123–134.
 - 21 Leisa Gibbons tested continuum thinking in a social media context in her PhD thesis, 'Culture in the Continuum: YouTube, Small Stories and Memory-Making', available at <http://kentstate.academia.edu/LeisaGibbons/Thesis-Chapters> (accessed 12 October 2016). It was awarded the prize for the best thesis in 2015 by the Australian Council of Professors and Heads of School in Information Systems,

One outcome sought by using a cultural model like this one within recordkeeping informatics is to bring everyday cultural concerns, including a conscious awareness of information cultures, into organisationally directed information projects. An organisation's information culture clings to all the points in the many models being presented in this chapter. It impacts upon the amount of attention its members pay to spacetime distancing, the stories they tell themselves, the scale and reach of those stories and how they translate narratives beyond their own boundaries. In other words this model represents the way living cultures, at any present points in time, have shaped or will shape the past and the future of the way organisations record their actions and perform their functions.

While the CHCM can be used to open up discussion of some basic heritage issues that impact upon group story-telling within a perduring 'create, capture, organise and pluralise' rhythm, it has a distinctive vector that connects it closely to all the other models. The spacetime distancing vector makes apparent both the elements of distancing and the importance of human-computer interaction to community informatics. The story-telling and narrative scale vectors similarly are significant features that need to be considered in any community informatics projects. The model's 'containers' axis points to a museum as the largest form of cultural heritage structure. As with the use of the words library or archives this use is generic. It is about the Greek notion of the muse. It can be a very traditional museum displaying treasures within glass cases or it can be a museum that has undergone the archival (perduring) turn and become an online and interactive digital entity. It can even be a website, and perhaps that is its most prolific modern form.

In most projects the model can be treated positively as part of the way communities can build up what a sociologist of emergence, Pierre Bourdieu, called their cultural capital. Each group should look to understand and maximise what differentiates them in their story-telling, including their meta-narratives, the way they carry stories into different times and places and how, when, where and why they choose to exhibit them to others. It needs to be done with integrity, however, and with an awareness of the plurality of story-telling otherwise this model will provide an explanation of post-truth communities.

indicating an appreciation of the emerging amalgam of information systems design and information management activities that continuum thinking is helping generate in academia in Australasia.

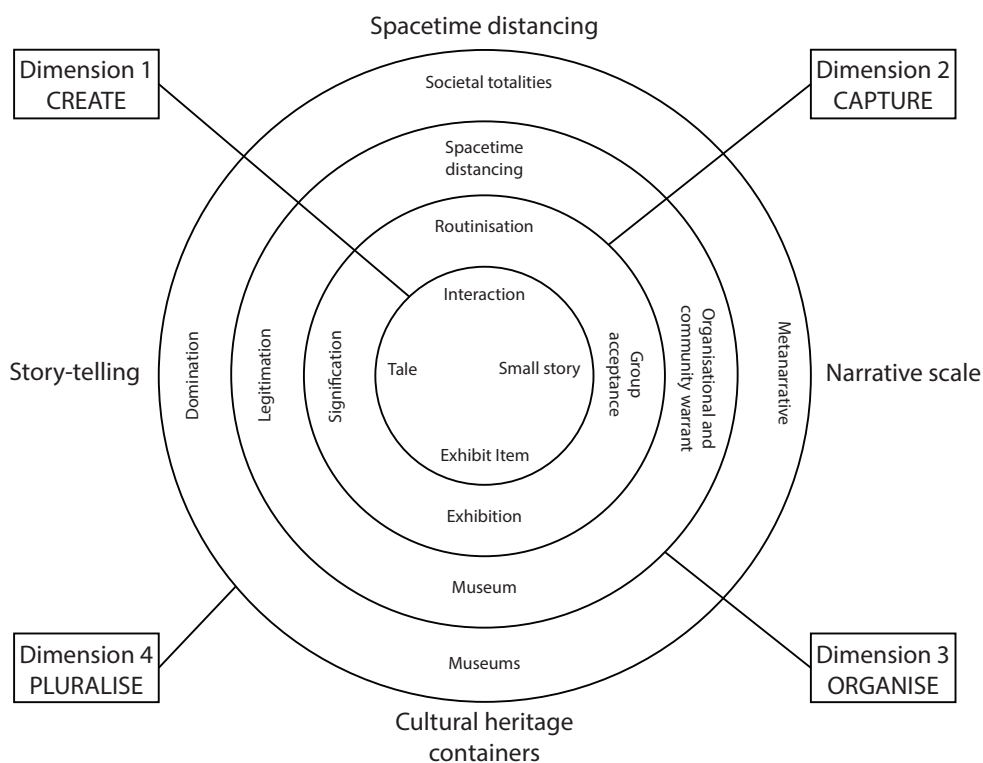


Figure 7.4 The Cultural Heritage Continuum (CHCM)

7.5 Trust in Technology and Data Continuum Modeling

When used in conjunction with the other models, the CHCM extends the trust in technology theme generated by a Monash University collaborative research project that began in late 2003, which has been extended upon by the subsequently formed Centre for Organisational and Social informatics. The initial Trust and Technology project had its origins in a

desire to build trust and understanding between the archives community and Koorie communities. It [was] based on a recognition that Koorie communities rely on sources of knowledge and methods of transmission that differ greatly from the knowledge frameworks of the wider community. The project's goal has been to understand the implications for archives of this fundamental difference in knowledge

systems, and to enable the development of alternative systems and services which reflect the priorities of Koorie communities.²²

The project involved collaboration between the Koorie Heritage Trust, the Public Record Office Victoria and several organisational units at Monash University and set a benchmark for the mix of social, cognitive and technical elements that have helped shape the approach to informatics in this book. Trust in technology in the wider community has often been seen purely as a technical issue and, while the technology needs to be able to be trusted in many different ways for authoritative information resource management, that is only a beginning.

Each of the models presented so far has a trust in technology element to it. Can you trust the production processes (the ICM)? Is there moral defence of the record (the RCM)? Have the dissemination issues been well managed (the PCM)? Is there respect for an adequate organisational information culture supporting and as part of business activities (the CHCM)? There is more to trust than how the information is managed, however, particularly within a world increasingly dominated by big data systems and we will look at a few information systems design and development models in this section.

In the 1990s two major paradigms for computation emerged for organisational business applications within a distinction between information and enterprise architectures. One was the World Wide Web which in it is seminal conceptualisations had the document at its heart. As we pointed out in Chapter 6 and earlier in this chapter, the World Wide Web Consortium is still digesting archival provenance issues within information architectures and there is now a pressing need to come to terms with cascading inscriptions.²³ The other major form of computation for business purposes in the 1990s involved data processing-based application platform interfaces for what were called enterprise architectures.

Data-processing platforms were attractive to some of the fragmented adhocracies that comprised a loose coalition of information systems design specialisations at the time, especially the data warehousing and programming branches. The internet paradigm, from a business perspective, tended to get lost in information management style issues relating to web design,

22 *Koorie Archiving: Trust and Technology – Final Report*, available at <http://infotech.monash.edu/research/about/centres/cosi/projects/trust/final-report/> (accessed 12 October 2016).

23 See Chapter 6 (at 6.6) and 7.2 above, and the sources noted in footnote 11 above.

as an add on to or additional vehicle for business activities. The business application design element is still in flux conceptually and practically as the system design specialisations begin to rethink the nature of enterprise architectures. As we pointed out in Chapter 2, some information systems specialists have begun to realise the depth and breadth of the challenge in designing business applications that can manage cascading inscriptions. Recordkeeping informatics practitioners can have no respect for arbitrary divisions between the information management aspects of web design and the use of data processing within business applications. Recordkeeping informatics knits together IM and ISD within the relationships established between actions, agents and the record during the business activity.

In the interests of bringing information systems design specialists into the fold of practitioners interested in implementing the archival turn, two models, an information systems design continuum model and a digital forensics continuum model will be presented. In both cases the descriptions of them will again be brief on the grounds that they are meant to dance within projects. If they cannot do that with a minimum of description, they will not be welcome additions to ISD project methodologies.

The first model to be presented, the Information Systems (Data) Continuum (DCM) (Figure 7.5), offers a spacetime continuum perspective on data-sharing techniques and is based on experiences teaching within multidisciplinary information systems design projects. One feature to note is that it was developed in 2000, more than a year before the twin tower terror attacks in the United States. Those attacks caused the understandable switch to big-data intelligence databases that have created so many problems with firewall security, cyberwar attacks, leaking and hacking. So, when in this book the point is made that well designed business applications provide an additional and more effective layer of security than firewalls, we are not being wise after the event. In 2001 a model for giving an archival turn to data-sharing techniques was already in existence and was being discussed in a few student projects at Monash University, not that any data warehousing experts then (and few now) would be aware of this fact. Even if the model was not robust enough at the time (or now) to provide for anything other than a simple project oriented overview of a very complex subject, it clearly presents an image of the sort of perduring thinking that is needed if the warehousing of intelligence information is to draw more effectively on the direct gathering of intelligence, which is presumably still a fundamental business activity of any security agency. The particular agent, action, record relationship that used to feature so heavily in the early intelligence-based

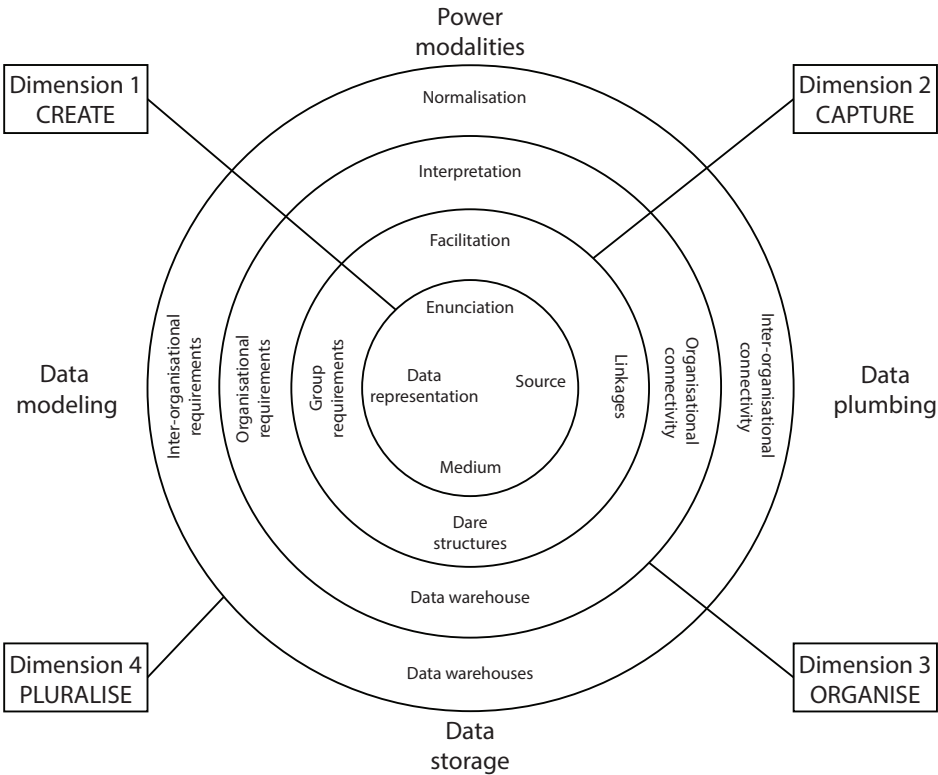


Figure 7.5 The Information Systems (Data) Continuum (DCM)

novels of John Le Carré might be too simplistic now, but direct recording of information within controlled nanosecond archiving that provides an extra layer of security needs to be part of any intelligence agency’s twenty-first-century agenda.

The model presents some basic elements involved in moving out from interaction in the moments of data capture, to routine forms of recording, different times and places of storage, and on to the digital multiverse. It emphasises the growing power of data management and the need for normalisation in data representation, an area where fixed rules are usually essential. It directs attention towards outcomes related to:

- the power of information, which can be achieved via the credibility of the source, the way its use is facilitated, how it is interpreted and how it is normalised,
- the way data is modelled and connected to other data elements, and

- how it is stored, an issue that is becoming more and more relevant to spacetime distancing issues within the so-called ‘big data’ stores of our times.

Data plumbing as a vector takes us into the way the data stores connect to people and the uses that can be made of the records. It goes a long way towards determining how well we maximise the use of material in the data stores and how ethically the stores are managed. The plumbing is changing from the approaches of last century based on intra-organisational connectivity at the front end without respect for the archival multiverse and the creation of archives some time after creation. Now cloud computing storage pushes things into the archival multiverse in a nanosecond, making electronic storage of memory increasingly risk-infected.

The power modality points to long-standing views in data management about the need to collect appropriate data and normalise it for systems use, but it also indicates what is going on within cloud computing. Power in future will be held by those who control data storage, whereas in the past an organisation’s control of document storage provided much of their power base. Those who service the clouds at least temporarily could rule in ways that those that have controlled records capture and archive formation in the past could only have dreamed about. Cloud computing will not go away, although it might go through a few name changes as disasters impact upon the marketability of the term. The technologies have announced themselves in emphatic fashion and there is a scramble amongst service providers to be the facilitator of choice. Those people who for various reasons do not trust the cloud are thrown onto the back foot, even though modern business application design methods are not yet up to the task of making the complex and varied records storage decisions that are needed.²⁴

The DCM is rough and ready, but Ferguson-Boucher’s digital forensics continuum model (DFCM) provides a more carefully researched view of continuum-based data governance issues (Figure 7.6). It deals with an activity where the need for an archival turn scarcely needs to be expressed. Within the paper era the dominant document paradigm had a long history built out of the relationship between archives and historical, legal and

24 It is a critique that has been made by archival authorities, but intelligence agencies are also aware of the problem; see, for example, the Australian Signals Directorate’s *CSOC Protect Notice, Cloud Computing Security Considerations*, updated September 2012, available at http://www.asd.gov.au/publications/protect/cloud_computing_security_considerations.htm (accessed 12 October 2016).

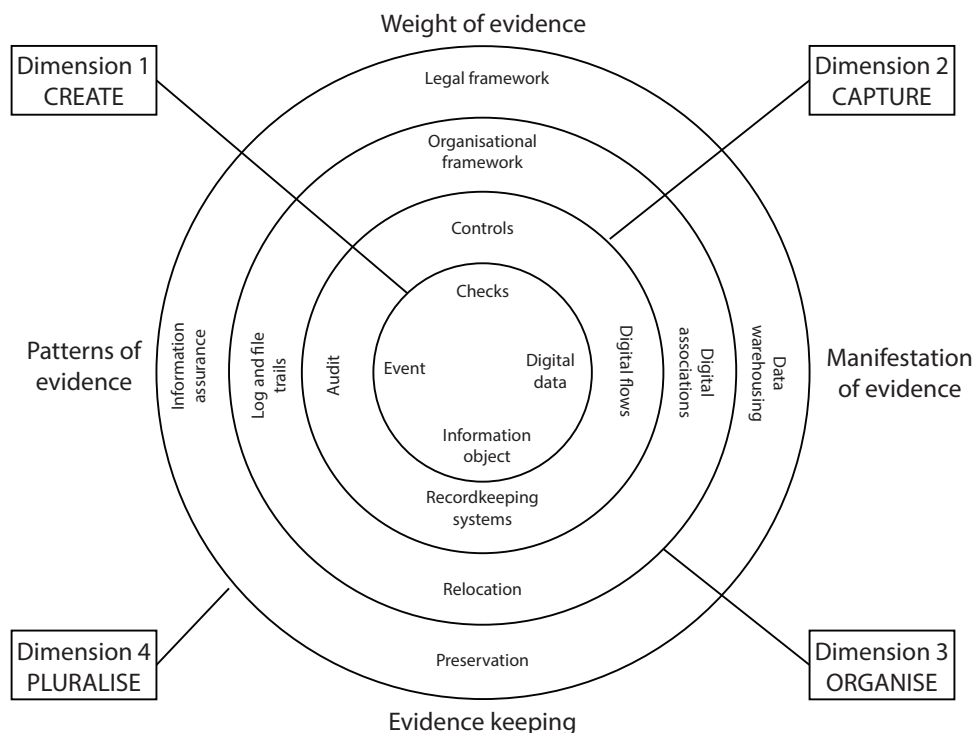


Figure 7.6 The Digital Forensics Continuum (DFCM)²⁵

administrative governance. Now the legal, administrative and historical information management tasks connected to the document have to adjust to cascading inscriptions, placing research into, and development of, digital forensics at the heart not just of data governance but of governance issues in general.

Digital forensics applied some time after mistakes and misdeeds have occurred is an unreliable process and is normally very expensive and difficult, no matter how dependable, cheap and easy it might look in the laboratory of a cold-case technician on a television show. From a record-keeping informatics point of view, the DFCM addresses authoritative

25 Kirsten Ferguson-Boucher and Barbara Endicott-Popowsky, 'Digital Forensics and Records Management: What We Can Learn from the Discipline of Archiving', paper delivered at the Information Security Compliance and Risk Management Institute Conference: Where Information Technology, Law and Risk Management Converge, University of Washington, Seattle, September 2008. (The model used a Monash website format but has been converted to the same format being followed in this chapter.)

information resource management in advance, within an approach that can be transferred into applications. If the notion of nanosecond archiving is to be turned into a major tool supporting the construction of self-authenticating archives, such archives will have to have been formed in ways that have considered digital forensics issues such as those set out in the model. It focuses on data as evidence and how we weigh it up, the patterns of investigating it, the way it manifests itself and the way it is kept, and visually displays the need for conscious attention to be paid to the formation of forensically ready digital archives in advance of any archiving actually occurring.

Nanosecond archiving even in data management comes back to the flicker, that moment between the creation of an inscription and its carriage forward within routines across spacetime and into often unexpected plural zones. The model points to the constantly flickering weakness in many big data stores. Much of the data have been ripped from initial contexts of interaction with little consideration about whether the archival trail has been, or needs to have been, maintained. This leads to mistakes that arise from information sludge. The results of ignoring perduring perspectives are beginning to be understood, but research is only beginning to demonstrate that recordkeeping informatics, by combining information management and information systems design components, can contribute to the better use of data in spacetime management. For example a research project at Monash University involved continuum thinking academics and the Commonwealth Department of Defence. It demonstrated the validity of the continuum perspective in managing wind tunnel data but, as the research report argued, there is so much more that needs to be done before the application impacts of data-oriented spacetime distancing approaches can become more routinised.²⁶ The key argument is that forethought about the future spacetime movement of data is essential. Otherwise digital forensics and related disciplinary specialisations are already being used too late.

Ferguson-Boucher's model shows that information resource management as a feature of data governance depends upon the weight, patterning and manifestations of evidence within our stores, placing a data-oriented premium upon spacetime distancing. It duplicates some of the points in

26 J. Evans, B. Reed, H. Linger, S. Goss, D. Holmes, J. Drobik, B. Woodyat and S. Henbest, 'Winds of Change: A Recordkeeping Informatics Approach to Information Management Needs in Data-driven Research Environments', *Records Management Journal* 24.3 (2014): 205–223.

other models emphasising the interconnected nature of all of them, and like the other models can dance when it is considered within a project. Again, like all of the models, the DFCM will only be fully useful if it helps us identify patterns (fractals) across our projects. Trying to master the capture of forensically ready records and archives that can cope when they spread into the archival multiverse is unimaginable within a one-size-fits-all approach to information or enterprise architectures. The project approach of this chapter is not extraneous. It is essential to developing mature business applications in the new world that is forming around us.

7.6 Continuum Thinking and Cyber-Infancy

In the above six models we have presented a perduring turn to archival practice, a shift from end-product thinking to thinking about cascading inscriptions as they move out into different spaces and times. It does not mean that other archival or records management approaches are irrelevant to organisational recordkeeping, but the information management and systems disciplines have been converging for some years and the turn should be part of that convergence. Otherwise, from a recordkeeping informatics perspective, the phrase cyber-maturity is a misnomer. One should instead use the term cyber-infancy.

The way to conceptualise inserting the turn into informatics practice is to consider the continuum mechanics involved in managing an expanding continuum of recorded information. The spacetime continuum thinking from early in the twentieth century, a time when a lot of disparate intellectual effort converged on things in motion provided this chapter's starting point. The development of specialisations fragmented the earlier convergence of views on the continuum and in learning from the past history of anti-convergence and the development of information specialisations the basic arguments of two continuum mathematicians have influenced the approach taken in explaining the models.

One is Imre Lakatos, who argued that the development of specialisations in mathematics closed off interdisciplinary critiques and awareness of what is being done outside the specialisation.²⁷ Digging deeper and deeper into particular approaches made it difficult to critique ideas from outside the different mineshafts of practices. The same phenomenon can be observed

27 Imre Lakatos, *Proofs and Refutations* (Cambridge: Cambridge University Press, 1976).

in information resource management. As recordkeeping disappeared first behind, and now beyond, the screen the recordkeeping single mind got lost and information professionals have had to engage with the chaos drive within the modern continuum of recorded information while wearing different sets of blinkers. The information-processing continuum common to all the models provides common ground within projects without damaging the expansion of the specialisations themselves. It can help strip disciplinary structures of their artificial shields and open up cross-disciplinary conversations about the direct recording of business activities in ways that can build useful and usable archives. Just as architects when they build a structure that can withstand both the passage of time and unusual events in spacetime require the support of a host of others from builders to mathematicians, twenty-first-century information architects of business applications will be dependent upon a hyper-network composed of many contributing professional groups.

The other mathematician is Benoit Mandelbrot whose set theorising has helped strengthen confidence in the future longevity of the form of business architectures supported in this book.²⁸ Forms of agile computing in which tailorable and modular applications are plugged in and out of use with an eye to ensuring their backward and forward compatibility offer the chance to adjust to change rapidly without abandoning a degree of constancy in information management and information systems design and development. The whole does not override the crucial need to address complexity in the working of the increasingly internet-based business applications, but nor does the complexity of the parts leave us with the constant need to bring order out of chaos. In paper the series provided a fractal, a pattern for managing complexity, and in digital business records management the fractal will be the business application.

The transparency and accountability of behind and beyond the screen applications in cloud computing can then be secured by the monitoring and auditing of the internal operating qualities and capacities of the application. This refers to unfamiliar forms of auditing and monitoring, even for basic communication apps. Most applications have internalised details that are not transparent to the user and, in the case of Android application stores

28 Mandelbrot set images are visually striking and presents the complexity of chaos and the existence of patterns across that chaos. While the mathematics is beyond us, the images square up well with continuum thinking about the relationship between the whole and the part and the need to identify fractals amongst internet-based business applications.

in particular, have included malware and Trojan horses. Microsoft has paid more attention to quality control, but no stores are independently measured for their business acceptability by any organisation with the requisite recordkeeping informatics skills and knowledge to make such assessments. Quite simply such organisations do not exist and we hope that this book will foster their emergence with a solid disciplinary base.

These basic ideas from Lakatos and Mandelbrot have helped drive the development of the perduring archival turn in this chapter as an adjunct to application design and/or implementation projects. Any such project should begin by asking what skill sets and knowledge might be needed and what will be the perduring requirements (that is, what information will be stretched into other times and places). Any business application can benefit from such a basic preliminary review, whether it is an accounting application, a weather measuring or predicting application, a conference system, or any other application with records that might have use in other spaces or times. Each application will have its own possible contingencies to consider and Table 7.1 can be used to provide a preliminary review and act as a checklist of possible stress points as design or implementation proceeds. While on the surface the table might seem too complex to have practical application, in fact it only puts together some very basic perspectives on perduring objects that project members are likely to bring to a task anyway. In teaching use within studio-style projects different project team members were given responsibility for particular continuum models, which was also a crucial technique in spreading the student stress that presenting a table with so many monads (details that might cause a project to fail) can initially cause. Teaching experience has shown that, using a stewardship approach, this table can spark ideas within design projects after the fear of it subsides. It also has proven useful in monitoring operations, auditing processes and investigating what went wrong in past applications.

The table is meant to support flexibility, not provide rigour. The rigour comes from the organisation's information culture, its analysis of business processes, and how well it applies recordkeeping functionality to access issues revolving around storage, appraisal and provenance (Chapters 3 to 6). There is still, of course, the problem of definitions. For any reader experiencing difficulty with understanding the points on the page, put the table in a project context and try to feel its breadth, depth and ability to cover expanding complexity. Do not treat the points reverentially. Play with the points and make them dance to a spacetime distancing rhythm.

In Chapter 10 we will argue that a technical approach on its own is amateurism. Cyber-maturity involves the ability to shift to different paradigms when necessary and to add social and cognitive perspectives to the technical ones. That does not alter the fact, however, that technologies and techniques used for the production of robust archives are central to trust in technology. It is just that, without an informatics approach, the archive that is the Internet will remain chaotic – a gloriously searchable chaos, but with many bits out of control. As Livia Iacovino has noted:

Adherents to the records continuum recognise that the authenticity of the record can be protected in multiple ways indefinitely, including outside the walls of an archival institution. However, the sheer quantity and dispersal of digital information in personal and public domains make it difficult to evaluate its authenticity. Archivists will need to think creatively about the nature of a record, the impact of social media on user expectations, trusted digital repositories that protect the authenticity of government and non-government records for accountability, restorative justice and identity, and greater user participation in the management of a self-authenticating archive.²⁹

You cannot separate organisations out from this hyper-task. In fact organisations and their business needs provide a perfect practical laboratory for the continuing development of trust in technology.

Socially, the continuum mechanics of modern informatics calls for a new breed of information professionals who accept convergence but want specialisations including their own to flourish within that convergence. If their specialisation is recordkeeping informatics there will be almost a missionary zeal to their contribution, focusing on the moral defence of the record. In the past moral defence was a provenance issue protecting both source details and the transmission of a reliable record through time, and the same issues exist today, albeit in very different technical forms. The archive, to be true to itself, only needs to tell the story of governance over spacetime, which is the initial idea behind its moral defence. In that form, however, it is plastic and morally indifferent, to cite William James perceptive comment on the multiverse more than a century ago. The bigger moral issue within

29 Livia Iacovino, Abstract for 'La Participación de los Usuarios y el Activismo Archivístico: Pilares de la Responsabilización, Identidad y Justicia Reparadora en la Propia Autenticación del Archive Digital [User Participation and Archival Activism: Cornerstones of Accountability, Restorative Justice and Identity in the Self-authenticating Digital Archive]', *Tabula* 16 (2013): 103–122.

Table 7.1 The Continuum of Recorded Information and its Complexity

The ICM (courtesy Reed, Schauder and Upward)

Continuum	Create	Capture	Organise	Pluralise
Action and Structure	Communicable action	Collaborative action	Organisation framework	Social framework
Categorisation	Element	Controlled element	Organisational domain	Global domain
Technology	Instrument	System	Organisational system	Inter-organisational system
Storage and Memory	Created memory	Shared memory	Organisational memory	Collective memory

The PCM (courtesy Upward and Schauder)

Continuum	Create	Capture	Organise	Pluralise
Learned Knowledge	Experience	Collaborative learning	Organisational learning	Social learning
Reach	Authorial intent	Group circulation	Organisational or community totality	Societal totalities
Issuance	Author(s)	Publisher(s)	Organisational or community authority	Societal authority
Publication Containers	(Public) item	Published item	Library	Libraries

The RCM (courtesy Upward)

Continuum	Create	Capture	Organise	Pluralise
Evidential Qualities	Trace	Evidence	Corporate/individual memory	Collective memory
Transactional Qualities	Transaction	Activity	Function	Purpose
Identity	Actor	Work unit	Organisation	Institution
Recordkeeping Containers	(Archival) document	Record(s)	Archive	Archives

CONTINUUM THINKING AS A BUILDING BLOCK

The CHCM (courtesy Upward)

Continuum	Create	Capture	Organise	Pluralise
Time-Space Distanciation	Interaction	Routinisation	Space-time distancing	Societal totalities
Story-telling	Tale	Signification	Legitimation	Domination
Narrative Scale	Small story	Group acceptance	Organisational and community warrant	Meta-narrative
Cultural heritage containers	Exhibit item	Exhibition	Museum (in the sense of location of a muse)	Museums

The DCM (courtesy Upward)

Continuum	Create	Capture	Organise	Pluralise
Power Modalities	Enunciation	Facilitation	Interpretation	Normalisation
Data Plumbing	Source	Linkages	Organisational connectivity	Inter-organisational connectivity
Data Modeling	Data representation	Group requirements	Organisational requirements	Inter-organisational requirements
Data Storage	Medium	Data structures	Data warehouse	Data warehouses

The DFCM (courtesy Ferguson-Boucher)

Continuum	Create	Capture	Organise	Pluralise
Weight of Evidence	Checks	Controls	Organisational framework	Legal framework
Patterns of Evidence	Event	Audit	Log and file trails	Information assurance
Manifestation of Evidence	Digital data	Digital flows	Digital associations	Data warehousing
Evidence Keeping	Information object	Recordkeeping systems	Relocation	Preservation

the archival turn, however, is that the archive can be used to suppress, repress or impress. There is nothing new in that idea, but what is new is turning that understanding into ethical control over our applications and systems. Large ethical questions are raised by the way the archive is formed and managed.

For archivists the turn raises issues about where the temple of Janus will be built. In Roman mythology it was built at the crossroads between the past and the future. In recent modern archival practice it was built some time down the track to receive end-products of action. Now, in digital archiving, it needs to be built at many crossroads using a network of multiple storage locations. The archive will be at the crossroads of here, there and everywhere. The custodial archivists and the janitorial records managers sweeping up after the action will still offer a valid paradigm in some circumstance. Their model, however, will have to co-exist with many other archives and records management models. Custodial archivists in particular have a legacy of material in custody to protect so the task of engaging with records outside of their custody will not be easy to fund or control, but for organisations and their archivally turned records managers the funding and management tasks are more straightforward. It is a matter of beginning to create an archive built upon a disciplined approach to directly recording the actions of the agents involved in business actions.

The issue of trust is an interconnected web and that in itself will be a crucial cognitive feature of informatics in the future. Within the many cognitive issues that could be raised here only two will be given space. First, networking is the new postmodern condition. It is perhaps ironic that in the 1970s information was often observed as replacing science as the dominant way of forming knowledge. Now it is the turn of information scientists, like the scientists of forty years ago, to come to terms with being downgraded in the popular knowledge production stakes. Networking as an emerging dominant paradigm for knowledge formation is the new postmodern condition. The second major cognitive feature to consider in relation to the archival turn is the need to develop and apply new forms of continuum mechanics to the expansion in complexity that is increasingly flowing out from the marriage of internet and web-browser technologies. Even with all the wonders of modern information and communication technologies to draw upon, gross mistakes within business processes occur too often. The dominant end-product and data-processing paradigms from the late twentieth century were not flexible enough. Agile computing paradigms provide a ready-made alternative for hosting the archival turn and for the

development of the continuum mechanics of modern information systems and applications.

Simply stating the problem and describing an informatics approach to the archival turn in the manner of a chapter like this one will not produce solutions. Those solutions will vary greatly from application to application and will be in constant need of modification in different times and places. Stating the problem, however, demonstrates the impossible nature of the task without taking the archival turn. A perduring approach means that solutions must be temporary ones found within an evolving mixture of structures and actions that respect the changing relationships between the universality of the whole (the archival multiverse) and the complexity of the parts.

A major feature of the modern archival multiverse is that the recording of information about business actions is taking place in a world where data, documents, records, and the archive are merging and blending into each other, setting up a requirement to be flexible. Conceptually, the models presented in this chapter have a common agile base for authoritative information resource management within the multiverse's dimensions of creation, capture, organisation, and pluralisation. The array of models allows for paradigmatic diversity depending upon the nature of the business activities and begins to bring together the hyper-network of skills and knowledge needed to make robust and morally defensible nanosecond archiving of business communications a possibility without delaying or interfering with the business processes themselves.

As we mentioned above, the detailed rigour has to be applied within the application, making the project method that is the focus of this chapter a lot more than an option. It points to the pragmatics by which continuum thinking can be transferred into practices. The hidden details behind and beyond the screen business activities and cloud computing are complexifying. Organisations can no longer rely on their intuitive understandings of recordkeeping the more it takes place in nanosecond archiving processes behind and beyond the screen. The communication apparatuses for business processes are multiplying and growing more and more mobile. Agile computing, however, can come to the rescue, as there are endless numbers of internet-based business applications that can be researched or developed. These can provide the pragmatic project base that can make the above models or their successors dance.

RECORDKEEPING METADATA AS A BUILDING BLOCK FOR RECORDKEEPING INFORMATICS

8.1 Recordkeeping Metadata as Simplicity in Action

Digital transactions and traces of activity (if they exist at all) are ephemeral, unmanageable and meaningless without the supporting backbone of metadata. Metadata is the quantum mechanics of digital actions. As with quantum mechanics, dealing with metadata is defining and using the very small particles invisible to the casual eye, which can then be put together in multiple ways to construct and identify and explain the behaviour, characteristics and interactions of data with other data in the digital ecosystem. Metadata, along with continuum thinking, forms the foundation block for recordkeeping informatics.

Metadata can be identified in any information system. It can be found in systems going back to managing clay tablets. But in the digital world it takes on a critical functionality because of its ubiquity and its fundamental importance in managing data, conveying information that is not physical but virtual and then supporting what organisations and people want to be able to do with that data. The digital world changes the game. While analogies to the paper world reality of files and folders may provide short-term comfort in making connections to the known, these analogies act as barriers in the maturing digital world. The paper-based assumptions about metadata's creation and management will not apply in the digital world.

For recordkeeping informatics, recordkeeping metadata is a focus on the formation and construction of transactions that are traceable and can be recombined and reconstituted in multiple technical environments for as long as they need to survive. The purpose of metadata here is fundamental to the recordkeeping informatics social goals of:

- spacetime management,
- opening up life-chances, and
- managing our mutual associations.

This is simplicity in action; to enable recordkeeping metadata to act as the foundation of digital transactions, a simple meta-message that is easily understandable must be crafted. The parts beneath, however, can be very complex. Starting from the complexity creates confusion and unclear messages, resulting in warring factions and conflicting multiple agendas.

8.2 The Great Metadata Muddle

Metadata, the concept, has recently been muddled considerably by the intervention of technologically naive politicians. In the context of the purported need to maintain the security of governments and societies against terrorism, many countries have implemented an ever-increasing capability to monitor individual citizens. The key means of doing this is by intervening in the flow of metadata about digital actions. As revealed in the Snowden leaks, the US government's reach to intercept transactions on telephone cables and through the backbone of the internet's infrastructure is unparalleled. Unimaginable quantities of data are being scooped up into governments' data centres and made available for the application of ever-evolving data-mining techniques. Traditional accountability mechanisms, such as oversight bodies, have been noticeably absent in establishing such operations. Driven by security agencies, these initiatives tend to operate outside black-letter law, flying under the radar in a secretive fashion. This was clearly the preferred model until the knowledge of what was happening was made public.

Many governments are involved in similar data sweeps and subsequent data exchange arrangements. Companies, too, are accumulating vast amounts of metadata from their transactions in the digital world. The complicity of internet service providers and big players, such as Google and Facebook, in allowing access to data or in deliberately building backdoor access into the operating systems of computers for security surveillance is a feature of the current world. As consumers we are promised enormous improvements in quality of life by enabling our devices to be internet-enabled. We are all subject to unknowable amounts of information being captured about our daily lives. All this is coming with a social backlash, which is being played out in many arenas at local, national and international levels.

Australia has passed controversial legislation requiring all internet service providers and telecommunications companies to retain metadata about their users' transactions for two years, and to make it accessible to nominated organisations on request. The driver for this legislation was purportedly civil security and the proposition was driven by law enforcement and monitoring agencies. Questions have been raised about this as our politicians bumble around trying to explain what exactly is being captured for reuse and the rationale for this capture. Is it actually part of our obligations under international treaty? Is it about multinational companies wishing to subvert data sovereignty? Is it also a mechanism to identify and prosecute people for copyright violation? Does it actually assist in identifying proto-terrorist plots?

In the Australian Parliament the proposed legislation was debated publicly as a 'metadata bill', which it is, but the task of convincing a sceptical public was left to our technologically removed politicians with some funny (if scary) results. The concept of metadata was consistently called 'contestable' and it was often stated that 'metadata is the envelope not the contents', and 'if you've got nothing to hide, you've got nothing to fear'. The legislation was passed.

Was the bumbling and fumbling about metadata real? Did it reflect a fundamental lack of understanding of our technology infrastructure among politicians (quite likely in a predominantly aging male cohort)? Or is metadata in this usage a means of saying to the public that it's all technical and complicated and well beyond the understanding of ordinary folk, who should just leave it to the specialist technologists to deal with. If so, there is a significant further dimension of digital literacy that needs addressing.

The great metadata muddle raises many issues relevant to recordkeeping informatics broadly, and the recordkeeping informatics metadata framework specifically. The scale and quantity of metadata pursued and collected about communications has startled many. Locking into a growing social concern about feelings of being under constant surveillance by unknown powers who may or may not be benign, the raging controversy presages many discussions. What data should be collected? Who has the right to determine what can be done with this data, to negotiate privacy for individuals, to determine who can access the data, to decide for what purposes data can be accessed and how, what to retain and for how long? Just because we can capture this data, should we? What are the ethics associated with enabling and empowering a society in which our toasters and other seemingly banal

appliances report individual behaviours in ever-increasing specificity to manufacturers? If society is uneasy about such extensive metadata being in the hands of government, how do individuals feel about this metadata being exploited by commercial entities for purposes over which they have no control?

The alarming statements: ‘metadata absolutely tells you everything about somebody’s life. If you have enough metadata, you don’t really need content’, and ‘We kill people based on metadata’,¹ highlight two very important characteristics of metadata. The first highlights that metadata is a hugely powerful component in the telling of stories. The content can be inferred. The second highlights that metadata is one of the enablers of technology. Algorithms based on data analytics are increasingly the way decisions are automated. Metadata is ‘the good oil’, no matter what species of information manager or information systems developer you belong to. But like oil, there are complexities to be understood and appreciated, or else we risk damaging our social fabric in addition to creating information sludge.

These are key informatics questions. The way information systems are designed must reflect the social mandates and expectations within which organisations operate. They are more particularly recordkeeping informatics issues, twisted to provide a particular insight into how recordkeeping currently works in the digital world. The twist expands the issues into areas of big data, the nature of the record, privacy, data analytics and sovereign rights. In addition, the metadata collection and retention controversy exposes just how close recordkeeping issues are to social issues. Professionally, recordkeeping professionals often claim such ground, but observation of the state-based reactions to the Snowden leaks and WikiLeaks provides a great illustration of how these issues are inherently socially negotiated. The digital world destabilises existing social norms, and the fact that the debate on metadata is carried out on the front page of the newspaper reflects this. Recordkeeping informatics and recordkeeping metadata are not an adjunct to the digital world, but positioned at its heart.

The current social controversy is about transaction metadata, that data that accumulates around the transaction. But transactions and the cascading

1 National Security Agency (NSA) General Counsel Stewart Baker and General Michael Hayden, former Director of the NSA and CIA, quoted in David Cole, ‘We Kill People Based on Metadata’, *New York Review of Books*, 10 May 2014, Available at <http://www.nybooks.com/daily/2014/05/10/we-kill-people-based-metadata/> (accessed 14 October 2016).

inscriptions documenting transactions can be both deliberately exposed to its subjects as processes where participants engage with the action, and also opaque – unclear to the participants and almost incidental to what individuals do. For ease of reference, the term ‘ancillary transaction metadata’ is used to reference this second type of metadata to distinguish it from the conscious transactional metadata that participants actively engage with. The ancillary transactional metadata is the stuff of big-data analysis and is largely creating the explosion of metadata resulting from individuals just going about our lives. Transport systems using smart cards preloaded and automatically topped up with credit, now routinely track movements on the transport systems. Many of the apps used on smartphones are busily transmitting details of our transactions, locations and more back to the owners of those apps – often without the end-user’s knowledge or consent. Smartphones themselves are by default geo-located and thus an instant potential tracking system. Appliances are increasingly able to collect and transmit metadata about our daily lives, as are many other things we interact with on a daily basis as the Internet of Things is made reality. There is no realistic prospect of opting out of this burgeoning plethora of data collection. And all this is recordkeeping metadata of a kind – metadata collected and used in the transaction of daily activities. But it is a little different to the metadata that organisations craft into information systems. This ancillary metadata is just being created and disseminated as a consequence of individual daily actions, and now it is capable of being captured and stored. The resulting data may well be a resource that outweighs the value of the initial process that created it – or such is the promise of big data. But individuals may not be aware of this and certainly may not have consented to its creation and capture.

The nature of the IT systems and design are determining technologically what data is created and captured. The capability of the technology to do this collection has well exceeded discussions – social and organisational – of the ethics of doing so. The rhetoric of big data and the notion of elusive public good to be derived from this data glut spur on the seeming desire to just accumulate more and more transactional data.

Governments and others, in their pursuit of information scoop up any and every form of transactional data around individual and community communications and while at times the goal of comprehensiveness seems desperate they are clearly working on something basic. Recordkeeping (transactional) metadata can enable the telling of stories, the reconstruction of events and the chasing of relationships well in excess of the content

of the transaction. Recordkeeping professionals have known this for some time, but perhaps have failed to exploit this understanding as well as they might. The traditional emphasis that archival appraisal has placed on the primacy of control records – those traditional registers and indexes that have typically been regarded as archives, even when the corresponding files or documents have not been extant – illustrates this long professional practice and knowledge.

All the talk is of big data and how organisational insights can be gained, individual lives can be immeasurably improved, and huge organisational efficiencies can be made. At present it's all a bit smoke and mirrors. As the popular meme has it: 'Big data is like teenage sex: everyone talks about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims they are doing it'.² But, regardless of the state of the hype or the transformation from big data to other buzz phrases, the reality is that this has moved from vapourware to practical reality in many organisations. The rise of data brokers is one indication of the change of the value of data in organisational contexts.

So coming out of a consideration of the great metadata muddle and the seeming inexorable growth in transactional data, what are the broader lessons or trends that can be drawn? These include the following considerations for recordkeeping:

- Metadata is potentially more important than content. Recordkeeping professionals know this and have known it for years. If the content disappears, stories can be told from the remaining metadata. In the case of any scandal, fraud or inquiry, it is the metadata that pins the event – the who knew what, when and in what circumstances was that information obtained or used. Why then, as a profession, are recordkeepers fixated only on the end-product – the content object? If the metadata that accompanies the record object is neglected in favour of the content, what is being lost in terms of rework, but also in terms of relevance? End-product fixation is not a viable strategy. If pursued, recordkeeping will always be the inheritor of the digitally incomplete, dead stuff.
- To what extent do we need to ensure that there is some overview on the metadata collected in our organisations? Just because we

2 Attributed to Dan Ariely, Duke University, circa June 2013.

can collect it does not mean that the organisation should collect it. Just because it exists does not mean that it must/should be shared. Where are the recordkeepers in the organisational or social debates on these issues?

- What type of reuse of metadata is appropriate? How does this intersect with ‘big data’?
- What are the ethics of use of this metadata when we know that aggregation of multiple individually innocent pieces of metadata accumulate into profiles which are then available for multiple uses – advertising, targeting, profiling, monitoring, etc.
- How long should metadata be retained? Should it always be associated with content? Should it be de-identified? How effective is the de-identification process when we know that the deep mining techniques are fundamentally pattern recognition tools and it is relatively easy for technology to crack anonymising protocols. Tools for data anonymisation are evolving very quickly to counteract these very significant privacy concerns.
- Who owns the metadata? What can be done with the metadata? Who decides? There are, for example, cases of companies going out of business but selling their accumulated customer data as an asset, or where personal data is being valued as a personal asset,³ not only a corporate asset.⁴
- Distinctions between data and metadata are a bit like dancing on the head of a pin. Depending on your point of view, often something can be either data or metadata. So debating this at length is a potentially wasteful experience.
- How does the social debate about trading convenience and efficiency play out in the specific cases being implemented in your organisation?

3 For example, using the 2013 Financial Times ‘What is your data worth?’ calculator, marketers would pay \$0.634 for my personal information (see <http://www.ft.com/intl/cms/s/2/927ca86e-d29b-11e2-88ed-00144feab7de.html#axzz2ePHWXB3K> (accessed 14 October 2016)).

4 Accenture, ‘Guarding and Growing Personal Data Value’, January 2016. <https://www.accenture.com/us-en/insight-guarding-growing-personal-data-value.aspx> (accessed 14 October 2016); World Economic Forum, *Personal Data: The Emergence of a New Asset Class*, 2011, http://www3.weforum.org/docs/WEF_ITTC_PersonalDataNewAsset_Report_2011.pdf (accessed 14 October 2016).

Within the broader social and organisational framework, recordkeeping metadata takes its place. When information systems are being designed, those with an interest in defining and structuring data need to be actively engaged. In recordkeeping informatics framework, this includes those reflecting the recordkeeping single mind as a core contributor. We know that data often outlasts the specific technology that created it. The appraisal processes discussed in Chapter 6 and reflected in other chapters demonstrates the analytic processes that can be brought to bear to determine this up front. Data is bundled into various aggregations that reflect the activity that is being done. These bundles, in whole or in disaggregated parts, need to move into new software for various business purposes and/or be robust enough to retain their semantic meaning beyond the practical operation of software. But more than this, the data used to build the bundles representing activities has to be able to be trusted at various levels, from 'good enough' to represent a transaction to the highest quality of assurance.

All this is the domain of recordkeeping metadata. It is a particular perspective on metadata devised by system designers. It brings a particular set of characteristics to the metadata environment. Recordkeeping metadata is designed to support traceability, authenticity and sustainability. These are characteristics not shared by all information communities and, therefore, the recordkeeping voice brings a uniquely valuable perspective.

Each community that requires and deals with information will define metadata that meets its own needs. For example, in the medical informatics community, the HL7 metadata protocols meet that community's requirements for data interchange and interoperability of health-care data.⁵ In the photographic community, the International Press Telecommunications Centre has released metadata for photographs, dealing with description and administrative requirements and providing the most relevant rights related information.⁶ The geospatial community have formalised metadata for the description of geographic information and services in ISO 19115. Digital preservation has a metadata standard in PREMIS. Every community will define its own metadata to suit its specific sectoral purposes, and these will reflect different levels of their community consensus. They may be local

5 Health Level Seven INTERNATIONAL, http://www.hl7.org/implement/Standard/product_matrix.cfm? (accessed 22 December 2016).

6 International Press Telecommunications Centre, *IPTC Standard: Photo Metadata (October 2014)*, Version 1.2. Available at <http://www.iptc.org/std/photometadata/specification/IPTC-PhotoMetadata> (accessed 14 October 2016).

organisational rules, rules imposed by popular software vendors in that community, jurisdictional standards, industry established standards, or most rigorously, international standards reflecting a wider degree of acceptance of the community's metadata requirements.

What this means for people approaching metadata for the first time, is that they must position the conversation about metadata. Metadata as a term must always be accompanied by a description of what community's metadata we are talking about before any clear understanding of what is being discussed can be assumed. In this sense it is similar to the term informatics itself; to be specific it always needs a disciplinary qualifier.

Recordkeeping metadata is about transactions and the positioning and placing of transactions in a cascade of inscriptions, enabling tracing of actions and relationships that expand out like ripples from a pond, overlapping, changing, and creating new patterns. Recordkeeping metadata supports the tracing of connections, relationships, linkages between individual inscriptions, and the bundling of those inscriptions into activity based aggregations. Transactions in this sense are both business transactions and the transactions enacted upon data. It is this latter type of transactional metadata that will enable the testing of assertions on authenticity, reliability, etc.

There are other issues to be discussed, but at its core, the recordkeeping focus is about being able to tell the story of the transaction: who did it, what did they do, what came before and what came next, when was it done. This type of metadata is not only restricted to capturing the initial action, but also applies to the record/information once it is captured into some sort of a system – who looked at this, was it reused, when was it changed, who changed it, forwarded it, reorganised it, linked it, etc. And even when the initial content object is deleted, the metadata may have an independent life of its own, as a reminder that the content object once existed, and enabling a trail of action to be rebuilt.

This is a very dynamic view of records or information that need record-keeping capabilities. It changes, moves and exists in multiple environments. What information is needed to accompany the object (whether that be a data blob, a field with a specific value from a scientific dataset, a more traditional document, a bundle of inscriptions or aggregations of bundles) as it moves through different environments? At its core, recordkeeping is about transactions between people or instruments/algorithms/systems doing activities that result in some sort of recorded trace.

Increasingly, other communities are working out that nanosecond archiving is important. There are a number of initiatives underway in the

data management world that seek to tag data extracted from a given data field in a dataset with provenance data – that is, persistently linking the data to its source, and thus providing a means of asserting the trustworthiness of that data value as it gets mashed, merged and moved well beyond the environment of its creation. Persistent identifiers are also being deployed in different contexts to ensure that the specifically referenced bundle of inscriptions is always locatable. Concepts of data traceability are core to understanding data and its veracity as it is merged, mashed and otherwise combined into new resources.

If anyone, in any discipline or organisation, wants information to be reliable and trustworthy, they must deal with some recordkeeping metadata. The concepts of reliability, authenticity, trustworthiness, etc. are not hard and fast when applied to information in any state. Information can possess these characteristics in a relative, or ‘kind-of’ way. Testing the characteristics is based on assertions made about the circumstances of management and action. Do we know where this came from, who authored it, who changed it, whether it has been ‘out in the wild’, etc.? Documenting this basic framework allows the assertions to be made, tested and promulgated, and it is this that provides recordkeeping metadata its point of difference. This is the transaction data about transactions (or recordkeeping process metadata), and it is growing increasingly important in the digital world. This is the simple whole view of recordkeeping metadata, because it complements the requirements of other disciplinary views, applies in all domains where there is a requirement for assertions of reliability, integrity, authenticity and usability across environments, and it is the view specific to recordkeeping informatics.

This view will apply, regardless of what metadata describes the content. Recordkeeping informatics as a simple whole metadata view focuses on the transactional nature of communication. Along with the capacity to link information to the activities and agents involved in formation, this ability to trace, track and subsequently assert the multiple actors, actions and contexts in which recorded information came to be as it is; this is the stuff of recordkeeping informatics. And it is this that is the core offering – or single whole metadata view – that distinguishes our disciplinary approach from others.

It is not a competition, but an enhancement. In the digital ecology that is emerging, many other information communities are beginning to understand the core transactional data and to define it because it is necessary, not just to meet specified compliance requirements of our professional approach. Of course, the recordkeeping view is specific to the recordkeeping

profession, but broadening the understanding of what recordkeeping metadata does is critical to ensuring that the characteristics that make records trusted can be asserted for any piece of digital information wherever it exists. While some cognate communities may be beginning to understand why we need to focus on this transactional data, others have unfortunately labelled this 'administrative' metadata, diminishing by impute one of the key characteristics of the reliability of data over time.

The recordkeeping informatics approach identifies what can be added onto the requirements of other disciplines to assist those communities with metadata needed to assert reliability and trustworthiness. This focuses not on the object or the content, but on the processes of formation, transmission and management. Of course, sitting underneath this simple whole are incredibly complex parts.

8.3 Recordkeeping Metadata as Fractals

Applying the logic defined above, recordkeeping metadata is not a scarce commodity, but rather, one that exists in abundance created by the technologies that allow agents to undertake business. Almost all of it is automatically created as information is created, moved around, shared, disseminated through the technology available in all organisations. The challenge is to ensure that the cascading inscriptions that evidence actions will remain meaningful and usable across technical environments and across time and space for however long they are needed. How to select, order and harness that metadata to enable the digital resources to last in robust ways over time is the challenge. Approaches must encompass means of embracing the diversity of our technical environment. The specific recordkeeping need focuses on documenting the story of transactions and in moving and managing recorded information through different times and spaces, in ways that complement the requirements of other communities to address their specific metadata requirements.

This stated ambit for recordkeeping metadata connects to a much broader world than that of the static end-product or document-oriented approach. It suggests areas for open engagement with many other disciplines, but we need clear approaches to take to that interdisciplinary discussion.

The recordkeeping metadata models that are derived from the continuum thinking outlined throughout this book provide the building blocks from which to construct these interdisciplinary conversations. Continuum building blocks move well away from the notion of fixed, static and end-product

resources. Rather, they stress the relational, networked, horizontal and vertical connections between core entities that we need to document to ensure robust and sustainable traces of action.

Recordkeeping metadata is an area where the fractal analogy we have been using throughout this book really resonates. Fractals are repeating patterns that display at every scale. This reverberates with the notions of aggregation that reflect the different patterning in inscriptions and then bundling of those inscriptions into logical cascades reflecting multiple bundles of activity. Each implementation can determine their own view of what to bundle and how to cascade bundles, but the recordkeeping metadata is the fractal depiction applied at whatever bundle or cascade is appropriate. So what are our recordkeeping metadata fractal patterns? Indeed these are well established and already standardised. They apply at any level of aggregation. Our patterns are expressed in this simple model:

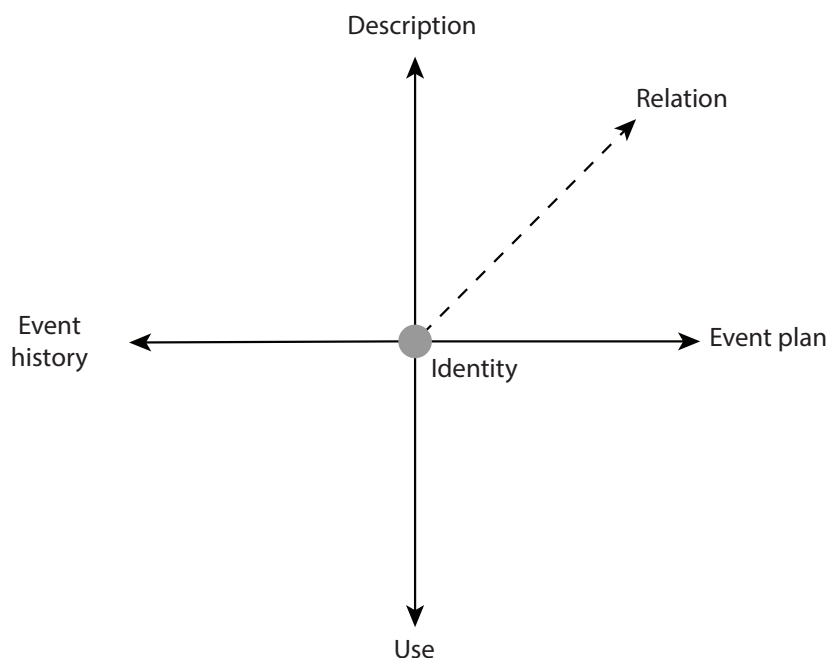


Figure 8.1 Fractal Patterns for Metadata⁷

⁷ Figure 6 Generic metadata model for managing records, section 8.1, ISO 23081-2, *Metadata for Records – Conceptual and Implementation Issues*, 2009, reproduced with permission from ISO under licence 1402-c102.

Figure 8.1 identifies specific metadata needed to accompany each entity. It is an implementation model, although still operating at a conceptual level. This diagram identifies categories of metadata needed to manage (as is appropriate to their needs):

- **Identity:** metadata elements that identify the type of entity (record, agent, business etc), aggregation level, unique identifier, etc,
- **Description:** metadata elements that describe the entity, such as title, classification, place, abstract, location, etc.
- **Use:** metadata elements that assist long-term access to the entity or rights attributed to the entity, such as technical dependencies or environment, access restrictions, whether there is personal information contained, any rights or licences, who the target or intended audience is, integrity information such as hash tag, the jurisdiction it is relevant to, etc.
- **Event history:** metadata elements that document the trail of past records events or other actions on both the entity and its metadata. For each event it specifies the type of event, what happened, when it took place, why it occurred, and who carried it out.
- **Relation:** metadata elements that associate two or more entities.
- **Event plan:** metadata elements that enable the automatic triggering of actions on the entity at some time in the future (for example, declassification, change to security permissions, destruction, changes to intellectual or other rights, periodic reviews, format integrity checks, migration, etc).

As to what entities we need to apply our metadata fractal model to, these will be determined by the business, but again stressing the simple, these are based on key recordkeeping understandings.

This diagram (Figure 8.2, opposite), presented already in this book as Figure 1.1, was developed in the mid 1990s by the Recordkeeping Metadata project at Monash University. It is a key diagram to communicate the simple essence of recordkeeping, but also allows for the introduction of the complexity as entities aggregate and multiple relationships form over time.

The original project explanation for the model is:

When people do business with each other, they create and manage records. The records created in the course of doing business capture the business done in documentary form. Business is here defined in the very broadest sense to encompass social and organisational

activity of all kinds. A simple way of defining a record therefore is as a document that has taken part in a business process, and thereafter provides evidence of the transaction of that business. In distributed systems environments, records form a significant subset of an enterprise's digital information and knowledge resources.⁸

These two simple diagrams represent significant complexity and flexibility in their application. Together the diagrams will be sufficient to guide the development of the recordkeeping informatics approach to metadata. Defining what entities, what bundles or levels of aggregation, what relationships can be defined is the key to building sustainable recordkeeping informatics approaches. This may differ for each instance being considered, and implementation options need to be creative and flexible.

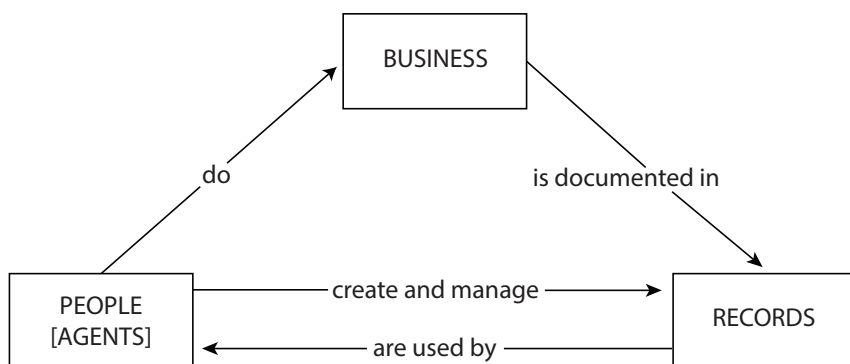


Figure 8.2 A Model for Recordkeeping as Network-based Social Theory

At its most basic, the bundling decisions about inscriptions need to be firmly documented in metadata about that entity. From there, how the interactions with other entities are captured will vary. Linkage upwards to rippling dimensions of aggregation will join with linkages to other entities at various layers of aggregation – creating a potentially ever-increasing web of connections and interactions. Implementations can choose the boundaries that they can realistically create and manage to limit the universe of possible connections. More entities and aggregations can be added, as required, beyond those defined as meeting the recordkeeping requirements.

8 Sue McKemmish, Glenda Acland, Nigel Ward and Barbara Reed, 'Describing Records in Context in the Continuum: the Australian Recordkeeping Metadata Schema', *Archivaria* 48 (1999): 3–38.

This very flexibility may be seen by some as an irritatingly non-specific and non-prescriptive set of requirements, but the nature of the digital world requires just this degree of flexibility. What it also needs is people prepared to think through the implementation opportunities and how requirements will be translated into specific implementation instances.

Recordkeeping metadata as a building block has, in its own right, blocks from which to build, but they need a new informatics perspective. It is not that the recordkeeping world has done nothing in relation to metadata. While the conversations have been happening for many years there have been some communications messages suited to an introductory space which have outlived their usefulness. Key amongst those is the message that everyone who deals with records deals with metadata. Of course, this is absolutely true, but like early analogies of the digital world which insisted on using metaphors originating in the paper world – like files, or index cards – such analogies have by now become barriers. Bringing the total paper orientation into the digital world without translation to the new environment becomes a barrier to appropriate adoption. Complex understandings can be misrepresented in these true, but superficial, metaphors. As we argue throughout this book, we need to get the paper past off our back, not continue to lug it around, and the metadata field is one where this shrugging off of the past is becoming imperative.

Our disciplinary metadata models tend to fall into these areas where they rebuild paper-based paradigms. So standards such as Dublin Core define a bibliographic style of metadata supporting information resource discovery on the web. Defined initially in 1995, the simple, flat set of metadata elements soon became inadequate to support the complexity of increasing demands. While the simplicity remains its key attraction to multiple communities, the Dublin Core community has been developing ‘application profiles’ since 2000. These enable the specification of more sophistication into the metadata. Further sophistication was introduced with the notion of qualified Dublin Core, which had extensions enabling refinements of the basic fifteen metadata elements. This development path follows a completely logical progression from a simple static interpretation representing a paper world approach to the realisation of more complexity and greater functionality as the community understandings of the web evolves.

Archival standards exist too. Presented as descriptive standards, they are widely influential in the European and Northern American archival space particularly. The articulation of descriptive standards is in itself a positioning statement. These models operate in a post-hoc, largely manually applied

environment. They are largely used by organisations to ‘standardise’ their own archival systems. Generally speaking they are designed for application to records conceived of as end-products – those things we’ve discussed throughout the book as a static approach not of great utility to recordkeeping informatics. Initially used to guide archival practice, and to some extent incorporated into early generations of archival management software, these standards have come to be used for interchange of data between organisations, using translations into more precise encoding schemes.

The standards accepted quite widely within the archival profession are those promulgated by the International Council on Archives. The most widely used of these is General International Standard Archival Description (ISAD(G)). This is essentially a set of metadata that describes records. It is records-centric, which means that it brings into its definitions descriptions of what we consider independent entities, and defines them only in relation to the records. The details of the other entities – agents, business (or function) – are seen as attributes of records. As in the Dublin Core community, greater familiarity and opening up of the possibilities of the digital environment encouraged revisiting of the standards to enable alternative and more extensive functionality. Still in the post-hoc end-product line, over time further standards have emerged in the archival world, e.g. the International Standard Archival Authority Record for Corporate Bodies, Persons and Families (ISAAR(CPF)) to describe organisations and people, and the International Standard for Activities/Functions of Corporate Bodies (ISAF) to describe functions. These two later entities are less widely deployed.

Recognising that archival practices which have developed over decades resulted in archival finding aids that embed metadata within their structure, a set of metadata standards have been defined for interchange of such finding aids. The Encoded Archival Description (EAD) model is largely a formatting metadata model, presenting the core ISAD(G) specification in an XML form. Similarly, an encoding schema has been written for context, namely Encoded Archival Context (EAC). Context here is again for our recordkeeping understandings too generic a concept as it muddies entities.

These metadata standards can be reinvented and reinigorated to be applicable in a recordkeeping informatics framework. At present their emphasis is post-hoc, or well after creation. While the recordkeeping informatics framework supports the continual addition and enhancement needed to ensure semantic interoperability over time and space, the core proposition for recordkeeping informatics is about designing metadata into systems, capturing metadata as it accumulates, inheriting that metadata persistently

linked to cascading inscriptions, presented or managed as aggregations, and always ensuring the capability of interrogation of information resources as to their origins and management.

While the existing archival models could be transformed into a part of this landscape, they need to be based on an underpinning of a robust conceptual model, on which work has commenced. The prospects are tantalisingly possible; these old-style manual models might have revitalised application in a world where metadata is plentiful and harvestable. Using the two simple models proposed (reproduced above) for the recordkeeping informatics approach, these older metadata standards can be assigned as appropriate at a particular level of aggregation. The advantages of this is providing connections back to previous practice and not having to retrospectively change in order to achieve better practice moving forward.

In the absence of imaginative transformation of how to use and interpret recordkeeping metadata, we instead are still in the realm of end products and lowest possible common denominators. Practices look antique and out of step with the way organisations are creating, capturing and reusing metadata.

But the communication challenge of the specific recordkeeping disciplinary take on metadata is considerable. These involve dealing with the at times almost religiously fundamental ad hococracy of professions in the workplace and gaining sufficient traction for management understandings of the specific slant of the recordkeeping informatics approach. So clarity about the specific viewpoint is essential.

The keys to this capacity to communicate recordkeeping metadata messages derive from traditional practice, but are transformed through flexible interpretation and fearless embracing of innovative and ever-changing technologies. The meta-message of recordkeeping informatics metadata is easy; every information professional working in the digital world recognises the need for traceability of action on data at various points in their practice. The fractals from which to build are clear and easy to communicate.

Frameworks from enterprise architecture create organisational environments receptive to recordkeeping informatics approaches. These architectures build from defined data elements, data models and reusable components linked to specific business activities. But care should be exercised in going down some of the enterprise architecture routes that are too closely aligned with proprietary methodologies, as they can overburden elegant simplicity with unproductive complexity and never ending analysis.

Recordkeeping metadata schemas that operate within these environments without being overwhelmed by rigidity are the goal. Concentration on the particular nature of the situated environment of applications is needed – and that is the social and organisational components of how to apply technologies to suit ever-changing digital ecologies. The expression of some of the core concepts around recordkeeping metadata needs to be finessed. The following paragraphs present some myth-busting propositions and some controversial challenges with which to build the messages.

Recordkeeping metadata rarely needs to be created. Metadata exists in huge quantities, as we explored earlier, and these quantities are growing, not diminishing. Various commentators have begun to talk about the unnecessary bloat or obesity of information storage where the core data is being blown out to enormous storage costs and risks by ignorant design where failure to understand and define problems has led to adding more and more and more seeking to avoid the peril of not having covered every eventuality.⁹ Clear analytic, upfront, design thinking can both address information bloat, and make maximum use of the metadata that is already created in transactions. Without recognising that this vast resource needs structuring for the purposes of reuse, reliability and repurposing, the opportunities of the digital world may transform into a burden.

Not every piece of data or metadata needs to be kept. This applies for metadata collected willy-nilly, especially in the great scooping exercises. At the very least, some of this data is going to be personally identifiable data, and mismanaging that type of data brings potentially very serious organisational consequences, both in terms of fines for breaching social requirements as such data inevitably leaks at some time, and in terms of trust in the organisation by consumers.

But it is not only personal data that has a legitimate expiry time. So too may much of the other data accumulating in organisations. Managing time-sensitivity is a strength of recordkeeping informatics metadata. Everything, including the relationships between inscriptions, is secured with a date that provides the building blocks of managing relationships over time: this data was used in this transaction at this time; this data was created or captured, or used, or changed, moved or transformed etc. on this specific

9 This phenomenon has been discussed in ‘Bloat’, post to *The Medium* blog, 21 August 2014, <https://medium.com/@delighted/bloat-6bccea185816#.4mikefl1y> (accessed 12 October 2016), and with specific focus on web pages in Maciej Cegłowski, ‘The Website Obesity Crisis’, post to his *Idle Words* blog, 29 October 2015, http://idlewords.com/talks/website_obesity.htm (accessed 12 October 2016).

date. Time-sensitivity is core to valid ongoing management, and also in terms of working out how long data needs to be retained for organisational purposes. How long will specific data support analysis? The variables that determine the validity of data for analytic purposes need to become part of the metadata determined by design. Some data can become organisationally toxic as its meaning or interpretation can change over time. Relying on old or disputed data can be very damaging. The good stuff risks being lost in the sheer volume of the noise being generated by excess data. What do organisations really need to manage within robust and routinised data management regimes? This is an age-old recordkeeping question, and one to which the recordkeeping informatics perspective brings much accumulated analytic know how.

What containment or structuring propositions should be brought to considerations of how to bundle cascading inscriptions so they reflect the business that is being undertaken? Again, this is an extension of some older techniques based on analysis of the business, but it will look very different from rigid classification schemes. The key is to reflect the business without overburdening the transactions. Adding these things as tags or classification schemes without reinvention is clearly a manual hangover from the paper-based world, which will not be sustainable enough to keep pace with the exponential expansion of the digital. New means of achieving this desired outcome within the automation of business applications is needed.

Recordkeeping informatics approaches to metadata stress the need to be able to recreate the state of a data/information/bundles or any other aggregation, at a particular point in time. This does not always mean that the desired bundle has to be rigidly fixed. The use of technologies that freeze data in particular forms is always problematic. As soon as a Portable Document Format is used to provide a 'fixed' format, there will be those who delight in unfixing the content for further use. Fixing in the sense of freezing something in aspic is not the requirement. Rather a more flexible interpretation would be to enable the 'replaying' of sequences of actions in order to prove or disprove the state of something or the conclusions reached. This has an emerging equivalent in the research data management world where there is an increasing requirement to retain not only datasets but also the executable methodologies used to derive the conclusions reached. In organisational recordkeeping informatics we can look to equivalences both at the bundle level (what was the state of the content of the bundle at a particular given time), and also at the level of documenting the actions (what were the processes deployed at a particular time to render the information

as seen by the viewer?). Recreating views from a time-based perspective may be a far more exciting path than the current crop of deep-freezing bundled inscriptions.

Systems typically retain heaps of metadata about the actions done on data within that system. These are usually stored separate to the system themselves as audit trails. Metadata for recordkeeping informatics emphasises traceability of the state of information at specific points of time and the ability to interrogate transactions forensically to determine states and actions that change those states. This is not something to be buried in audit trails, but rather linked to the bundled inscriptions at whatever layer of aggregation it is being managed. Conceptualising this metadata as audit trails leaves it vulnerable to deletion and also perhaps retains too much metadata over time. Just as some information has an expiry date, so too potentially does this need to prove the data. Traditionally this might have occurred when the bundle moves across a physical or custodial boundary. In a digital world, the relevance of custodial boundaries is less obvious and requirements to prove data at whatever layer of aggregation is defined will be more important than ever.

Metadata to enable interoperability is key. Systems are increasingly built out of disposable modular functionality, located in the cloud or sourced for one-off or sustainable organisational purposes. The consequence of this agile, dynamic environment, supported by robust data models defined in enterprise architectures, is that the data needs to exist with a degree of independence from the technology that created it, enabling the interoperability to be realised. The better documented the data, the clearer the design principles, and the better the chances of the data to sustain organisational purposes.

If we are entering, or indeed are already in, the world where ‘we kill people based on metadata’ to what extent is it a requirement to be able to ensure that such decisions are accountable and were based on the certainty of reproducible data. Such decisions may be as banal as when to trigger an alert within an application, but may also be as significant as life and death. These decisions are essentially the equivalent of business processes undertaken now, not by a human agent but by a machine using complex and interdependent algorithms. The concept of agency and responsibility embedded in such algorithms is being debated in the socio-legal-technical world.¹⁰ How should we attempt to trace and manage the evolution of algorithms that track action?

10 For example, Ryan Calo, A. Michael Froomkin and Ian Kerr (eds), *Robot Law* (London: Edward Elgar, 2016).

Many of these challenging questions and areas will not be solved by recordkeeping informatics practice alone. They need interdisciplinary thinking and collaboration across disciplinary boundaries. But there is a very legitimate component of thinking and approach that recordkeeping informatics brings, particularly from the socio-organisational perspective, to supplement the technical expertise of information system designers.

8.4 Metadata Aspirations

The challenges presented in the previous section quickly become the realm of research problems. The approaches and mechanisms do not yet exist, and current approaches are far from satisfactory or successful. Recordkeeping metadata is the foundation stone for the formation of information as trusted and reliable recorded information that can stretch out into new spaces and new times.

Accordingly any defects in the simple direction of metadata at authoritative resource management can raise serious problems. But at complex levels just what should metadata supporting a recordkeeping informatics approach be aspiring to? Here is a preliminary list of things that we need to pay attention to in the evolving discussion:

- Supporting and/or creating adequate bindings or perpetual linkage between inscriptions as they are bundled into the cascades that represent action (see Chapter 4);
- The design of metadata into systems to meet the requirements that we know about at the time the system is being designed – with, or without, the involvement of professional recordkeepers;
- The embedding of metadata into the ways of digital working, whether these are located within the boundaries of organisational systems, supporting data stored independently from systems or operating in the cloud, or on the web itself;
- Enabling the interrogation of any information so that assertions in relation to quality, reliability and trustworthiness can be made;
- Supporting interpretation and interrogation in multiple environments as those environments change over time;
- Supporting networked resources, created in one environment and repositioned or recreated in others;

- Supporting fluid boundaries to the bundled inscriptions, enabling links to be made internally and externally to related entities, resources and actions;
- Enabling flexibility and fluidity, but also making it possible to recreate point-in-time representations of the state of the inscriptions, however bundled, to support evidential requirements;
- Enabling multiple different interpretations to be layered on top, always adding new dimensions to the record, maintaining its dynamism and relevance to the past and present;
- Protecting information, where necessary, from privacy breach or improper use by establishing appropriate licences and rights which can be monitored and authorised, or permitted in nominated circumstances;
- Promoting new ways of connecting using metadata about people and events to be linked into the broadening enabler of the semantic web as it develops iteratively;
- Enabling exploration of records and importantly metadata accompanying those records in new ways, using emerging tools such as visualisation, data analytics and the techniques of big data;
- Ensuring that data is open and is readable by all – and exposed as soon as possible and in as much detail as possible (subject to the few real and relevant constraints) to the clever users of the present and future who can and will create new tools and continue the process of interpretation and meaning making;
- Allowing metadata to exist at the smallest layer of granularity that can be supported by the resources available at the time of an action.

This list can no doubt be added to, but even in this preliminary form it outlines a big ambit for recordkeeping metadata. This is what we aspire to, positioning recordkeeping metadata as a key enabler of the management of complexity within simplistic notions of broad recordkeeping informatics spaces such as the ones being offered by cloud computing technologies. Without robust metadata to enable the positioning of transactions within their environments of creation and management, information very quickly deteriorates into information sludge. With great forensic effort it might be possible to uncover and document some recreation of previous environments, but with foresight and a little application to the design of information systems, its deterioration into sludge can be averted.

Part Four

The Future

PROFESSIONALS AND AMATEURS

9.1 A Transdisciplinary View of Information Professionals

This chapter contemplates what happened to the twentieth-century dreams of information professionalism, given the disruption in access to recorded information about our actions discussed in Chapter 5. The last half of the twentieth century saw a rush of information specialists claiming to be part of one distinct profession or another and forming professional groups or strengthening existing groups, including librarianship (one of the first groups to form), archives administration, records management, information management, data management, information systems design and development, and information technologies. The groups still exist or have expanded into new forms, but, in an era when the fragmentation of information skills and knowledge is a dominant feature, it can be argued that their professionalism has been undergoing major disruption as a result of external management and technical forces, as well as because of their own internal fragmentation.

Some of the causes of the disruption and fragmentation will be discussed in this chapter, but our concern is a forward-looking one built on the premise that the professional dreams of many groups of information specialists in the last century are now in disarray. What can be done to reinvigorate professional input in the digital era?

In this book we are experimenting with transdisciplinary mechanisms for change across all information based specialisations. Informatics is a transdisciplinary word. Shuffle another word in front of it and it becomes a specialisation, but it still has a general meaning on its own. In this book, that general meaning is that all information specialists can, and should,

have knowledge and skills about how their disciplined area of study contributes to society, how it helps knowledge to be formed, and how related technologies and techniques can be used to maximise these social and cognitive roles. In short, informatics has a coherent meaning, but it covers massive diversity in the manner of those strongest professions in society, medicine and law. Both professions have fragmented massively over the last century, but have done so without disintegrating. Is it possible to imagine the many information professions as part of an informatics profession and trace out and manage its diversity?

In order to do that, we have to move away from a term that might be regarded as synonymous with informatics – information science. Science (not medicine or law) was the touchstone for all those quasi-professional information groupings that sought greater status. Information science has, therefore, an unwelcome echo of trying to attach professionalism to an image of objective knowledge formation that was very strong in the first half of the twentieth century but, ironically, as we have noted in a few parts in the book, had been damaged in the last half of the twentieth century by the rise of the cognitive, social and technical role of information. In the 1930s science had acquired cult status, but by the 1980s the new dominant cult in cognition was information, the so-called postmodern condition.¹ The quasi-professions sought status within a shared faith in scientific method that, ironically, they were helping to diminish.

This diminishing respect for science, typified in the denial of inconvenient truths such as climate change, is not something to celebrate, but merely something to observe, especially now that the abundance of information has shifted us, as has been argued, towards the cult of the amateur.² In other words, informatics, with its transdisciplinary meanings (meanings that can be applied across all fragments surviving from the era of trying to professionalise information), is a more pragmatic term than information science. It is a better term in that within today's environment, with its emphasis upon the present moment, it can have more immediate effect. Similarly, recordkeeping informatics can be given immediate meanings for the present day and the digital era, even though underneath

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- 1 Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge*, trans. by G. Bennington, and B. Massumi (Manchester: Manchester University Press, 1984) (first published in French in 1979).
 - 2 Andrew Keen, *The Cult of the Amateur: How the Democratization of the Digital World is Assaulting Our Economy, Our Culture, and Our Values* (New York: Doubleday Currency, 2007).

that particular label there is the larger science of recordkeeping that has failed to gain the status as a major area of study that we clearly think it should have attained. Thus our focus is very precisely on the three forms of analysis and two building blocks as a modern logic and we try not to be distracted by detailed discussion of how this has worked itself out in societies in the past, or speculate too far into the future of recordkeeping informatics as a science.

Those building blocks have to be applied with the help of others who will hold to different mental images of their information professionalism. Our view of an information professional is not merely someone with a specialisation in information; it is someone with a social, cognitive and technical grasp of how their specialisation can contribute to a whole and, with others, can help manage the complexity of the parts. It is the collegial single mind. Transdisciplinarity should be at the heart of information professionalism in a digital era. The key issue here is that an information professional needs to have some things in common with other information professionals if they are not to be merely part of a fragmented adhocracy.³

The purpose of this chapter is, therefore, to indicate the commonality of a need for social, cognitive and technical perspectives across all information specialisations. The following three sections explore these perspectives in more detail, and we also return to the vexed question of professional competencies for recordkeepers.

9.2 The Social Role of Information Professionals and the Issue of Evidence

This first perspective for information professionals involves having knowledge and skills that connect to a social role worth carrying out. Most literature on this topic for information professionals will be disciplinary in the first instance rather than transdisciplinary. Two of the authors of this book, for example, were editors and contributors to a leading monograph on the relationship between recordkeeping, archives and society.⁴ These sorts of grounded perspectives are needed, but for a broader and

3 Rudy Hirschheim, Heinz Klein and Kalle Lyytinen. 'Exploring the Intellectual Structures of Information Systems Development: A Social Action Theoretic Analysis', *Accounting, Management and Information Technology* 6.1/2 (1996): 1–64.

4 Sue McKemmish, Michael Piggott, Barbara Reed and Frank Upward (eds), *Archives: Recordkeeping in Society* (Wagga Wagga: Centre for Information Studies, Charles Sturt University, 2005).

more expansive view there are a number of sociologists over the last 120 years who have made major contributions to thinking about the societal role of information in connecting us and governing our actions. Their interest comes from an automatic need to try to understand the relationship between people, their informatics, and the communication and information storage processes needed to set up adequate social relationships in any society and with other societies.

Sometimes they contribute the perspectives we need to develop the topologies and topographies that we discussed in Chapter 1. The sociologist Anthony Giddens, for instance, opens up concise topologies. One example of this is seen in the logic of access which for Giddens depends upon information storage: 'The storage of authoritative and allocative resources may be understood as involving the retention and control of information or knowledge whereby social relations are perpetuated across time-space. Storage presumes media of information representation and modes of information storage and dissemination'.⁵

Actor–Network Theory, at least as it has come to be expounded by Bruno Latour, on the other hand, is more useful for exploring complex topographies. Latour is part of a French intellectual tradition that flows out from the work of continuum thinkers like Gabriel Tarde and Henri Bergson. In the work of such philosophers there is a monistic viewpoint (a simple whole), which Bergson found in the evolutionary operation of the spacetime continuum and Actor–Network Theory finds in the modern-day expansion of information into cascades of documentation. Latour however reflects with more enthusiasm on Tarde's view of the need to study the monad (the part) and the way it is much more complex than the whole.

As we mentioned above, there are many ways of looking at the social role of the groups of information specialists that emerged and then fragmented during the course of the last century, and we suspect that all groups could, with some application of thought, develop their own form of Actor–Network Theory. Certainly recordkeeping informatics can be developed in this way. In fact a lot of literature has developed in the archival profession dealing with the clear identification of the agents or people involved in resource production/formation and a capacity to locate those agents/people within a time specific role, place and competency. It has also involved representing what actions were being performed at the times of

5 Anthony Giddens, *The Constitution of Society* (Cambridge: Polity Press in association with Blackwells, 1984), 261.

action resulting in or affecting the record. It involved linking the actions together to enable a story to be told about accumulating actions. It involved providing sufficient robustness for the representation of all those component pieces of information so that they will last for as long as we need the record to last – that is that there was a longevity and sustainability inherent in the information object when it needs to be present.

That literature (the archival literature of evidence) will continue to have its uses in exploring ideas and practices, but archivists have yet to find workable topographical models for any implementation of evidence approaches in the digital era, although topological models have been found within projects such as the basic agent–record–transaction model presented in Chapter 1 (Figure 1.1). Even in research the topographical models, such as those based on the diplomatics tradition that focused on documents as a single referent, are likely to be out-of-date. The digital era with its extended challenges caused by the cascading information streams that now need to be managed emphasises the need to get on top of new and expanding complexities when capturing records and forming archives. We need to build more archival control into those cascading action streams whenever we want to maximise the way we interpret, mine and reuse information resources in different circumstances.

That said, however, there is no immediate point in developing a research-based discipline if, for teaching and training purposes, there are no jobs for students to move into. It seems appropriate to come back to a variation upon a suggestion made a few years ago by Upward, McKemmish and Reed that we need Archives and Evidence Commissions. The argument was a basic one. Because of our changing information spaces, we need new structures, tactics and strategies as circuit-breakers to address the decay in authoritative resource management that is occurring. The idea of Archives and Evidence Commissions was unlikely to be embraced by the archival institutions widely at the time, given that it was precisely their monopoly of structures, tactics and strategies that the authors were challenging. We are not unsympathetic to their problems. They have themselves been swamped by the tsunami of change in information and communications technologies, and, to mix metaphors, are up to their neck in alligators.

For this book, with its organisational focus, there is much more scope for creative, quick and pragmatic responses. We need archives and evidence work units. Most medium or larger organisations already have on staff many people suitable for training in the work of such units, and the advent of cloud computing makes the need for such units very obvious. Accordingly

it is timely to flesh out some of the tasks that people involved in authoritative information resource management with organisational archives and evidence units could begin to put in place. In doing so we hope some of our major archival institutions will join in helping to establish Archives and Evidence Commissions, promote archives and evidence units in organisations and not see them as threats to their own status and authority.

9.3 Cognition, Cloud Computing and the Cult of the Amateur

Of all the changes to our information and communication technologies over the last twenty-five years, the most powerful has been the marriage of internet and web-browser technologies in the early 1990s. From a cognitive perspective this has led to profound and ongoing change. The union of the two technologies has altered both our ways of forming knowledge and the way we view it. It took two entities with their own goals relating to organisational interconnectivity (internet protocols) and information referents connectivity (web-browser protocols) and has spawned a third force, cloud computing, which has sprung up in uncontrolled and opportunistic fashion. Cloud computing is changing the nature of information systems and information technology professional roles. Concurrently, despite all the activity and cloud first initiatives mandated by governments and private sector, there are still immense areas of uncertainty and ambiguity, particularly in relation to both organisational interconnectivity, where cloud computing is treated with great distrust, and managing the cascading torrent of referents within the expanding continuum of recorded information, where cloud computing for the most part only offers technical approaches.

For organisations, control of the once crucial in-house design and storage services of business applications are shifting from the organisation to an expanding host of service providers, all of whom require effective and independent vetting as well as monitoring for their trustworthiness or the quality of their services. No organisation or government should be comfortable with this, but they do not have the professional support base of recordkeeping informatics specialists who can advise them on how to avoid being swallowed up by the hole in the fabric of the once organisationally controlled continuum of recorded information. Meanwhile the spread of cloud computing continues seemingly unabated.

The experience of cloud computing can be summed up by two contrasting images. One is the positive one; the cloud will help us in so many ways

and will do so at reasonable cost as we all become part of the wired world. On the other side of the coin, there is the negative one of cloud computing not only as a home for the dark web that is an expanding haven for crime, corruption, deceit, terrorism, and all human vices but also as an enabler of surveillance activities. The positive image is the one governments love when they imagine they are coming to terms with the information era by providing information about their services or getting clients to do as much of their bureaucratic work as possible in much the same way that banks have transferred much of their work out to their clients. The dark image is the one many information activists have of governments and of their information governance policies. Our politicians, bureaucrats and technocrats fumble their way forward into a world they do not understand, failing to successfully renegotiate key citizen concerns such as privacy, transparency and accountability while at the same time trying to apply firewall strategies and old laws to suppress access to all the information that is waiting to be liberated from its limiting contexts.

There are those amongst the technologists that have helped deliver the new world who are becoming disillusioned by the way the internet has only lived up to a part of its imaginable potential. One of those, Andrew Keen, coined the phrase ‘the cult of the amateur’⁶ to describe how user-generated content had begun to dominate cognition within a rapidly expanding but poor quality world of internet-based information and lampooned the obsession of some with social media. However, the risks inherent in adopting such an argument are that the power of social media to enable participatory approaches to the archive and to recordkeeping become obscured. Our discussion of amateurs and rejection of amateurism should not be interpreted as ridiculing or rejecting social media as a technology for providing a voice to others. The situation is infinitely more nuanced and complex than Keen’s writings may suggest. Our focus is directed at the diminution of professional expertise and the encroachment of amateurs on authoritative resource management.

The encroachment of amateurism has deeper roots than the internet. As we have argued regularly in this book, professionalism and information science were being leached out of the evaluation and use of information well before the marriage of technologies caused an accelerating spike in the expansion of the continuum of recorded information. Even in administration, conventional evidence-based approaches began to be supplanted, as

6 Keen, *The Cult of the Amateur*.

we saw in Chapter 3 in a discussion of the management ‘search for excellence’ of the 1980s, in which organisations began to give themselves over to goal-setting techniques and a ‘keep it simple’ mentality that failed to look hard enough at the expanding complexity that was engulfing them. Subsequently, the internet has compounded the problems caused by looking away from complexity. Even in the intelligence industry, senior government officials like Donald Rumsfeld began to produce gibberish about there being ‘known knowns, known unknowns and unknown unknowns’,⁷ while steadfastly ignoring what was really going on in relation to evidence-based decision-making within the continuum of recorded information – the collapse of the power of individual referents and the need to come to terms with the cascade of documentation.

Keen has continued and deepened his critique in a subsequent book, *The Internet is Not the Answer* in which, ‘he wants to persuade us to transcend our childlike fascination with the baubles of cyberspace so that we can take a long hard look at the weird, dysfunctional, inequalities, comprehensively surveilled world that we have been building with digital tools’.⁸ In other words, the critique that the internet is failing to cope with social needs for authoritative resource management is part of a much broader critique. Societies are becoming totally dependent upon vulnerable and intrusive technologies that leave us open to cyberwarfare and the power of those who are rapidly accumulating vast wealth out of the jurisdictional breakdowns that enable the adoption of global marketing tactics and tax minimisation strategies.

Tools like Wikipedia can be used to identify the critics of the internet and give overviews of their positions. Each of the following figures, for example, present critiques of how internet technologies are not fulfilling their potential for information resource management:

- Jaron Lanier (the error-ridden nature and slowness of the dependence on programming within our application platform interfaces, which have been holding us back from agile forms of computing);

7 Errol Morris, ‘The Certainty of Donald Rumsfeld (Part 1)’, *New York Times*, 25 March 2014. Available at <http://opinionator.blogs.nytimes.com/2014/03/25/the-certainty-of-donald-rumsfeld-part-1/> (accessed 17 October 2016).

8 John Naughton, ‘The Internet is Not the Answer Review – How the Digital Dream Turned Sour’, *Observer*, 1 February 2015. Available at <http://www.theguardian.com/books/2015/feb/01/internet-is-not-the-answer-review-andrew-keen> (accessed 17 October 2016).

- Astra Taylor (the internet reflects and entrenches inequality);
- Nicholas Carr (internet technologies are having a detrimental affect on our cognitive skills);
- Anthony Appiah (people need to use the technology to embrace cosmopolitan difference, not iron it out);
- Aleks Krotoski (attempting to untangle the Web involves thinking a lot more about privacy, identity, the concept of online friendship and many other social, cognitive and technical issues).

Sitting above such commentary there is Joseph Schumpeter's critique of the Internet as a tool of 'creative destruction', a disruptive force like none any society has ever had to deal with before.

The above summary of internet commentators has ironic overtones. It was sourced from Wikipedia, which in itself can be regarded as part of the 'cult of the amateur'. The more the continuum of recorded information expands through user-generated content, the more we are dependent on user-generated summaries, no matter how accurate or how misleading the summaries might be. The cascade of user-generated content is disrupting the traditional processes for human cognition.

Our use of this supposedly amateur knowledge tool highlights the complexity of the situation. Evaluation – deciding whether to trust sources of information and determining how they can be applied – has become more complex and difficult than ever before. Cognitively, it is hard to dodge the Wikipedia dilemma, but we cannot be accused of not taking modern changes to cognition seriously enough or of failing to look at complexity from the viewpoint of a recordkeeping single mind. At the heart of our approach is the aforementioned difference between the simple whole (the monism, which in this case is the expanding continuum of recorded information) and the complex parts (the monads, which in the case of access are the many contingencies involved in managing access to the aggregation of documentation, not simply access to a document as a single referent). The point of recommending a single mind approach within the diversity is that single-mindedness can help deal with the expansion of content, but only if it operates in conjunction with other single minds. All the minds can be brought together within informatics frameworks and a focus on authoritative information resource management.

That is where the gap is; the amateurs are outstripping the professionals at every turn when it comes to allocative resource management. This can be accepted except in those situations where our mutual association,

life-chances, or spacetime management are at stake. Our approach to access, in other words, is being built out of a recordkeeping-based form of Actor–Network Theory and its acceptance of a cascade of referents, rather than out of Wikipedia digests. However, those very digests or summaries often provide useful starting points that a specialist mind can push in new directions. Just based on our rudimentary list of internet critiques compiled using the amateurs’ beloved Wikipedia tool, a host of issues to further research are revealed. These include greed, taxation laws, inequality, man’s inhumanity, internet-based business applications, diversity, vendor management, privacy, and identity, many of which should be bread and butter issues for the recordkeeping single mind operating within archives and evidence units.

Our information dissemination and representation problems are so wicked that we argued earlier for Archives and Evidence Commissions that can be set up at global, national and business unit levels, forming a web of agencies involved in finding new ways for managing access. At organisational level, there are many pragmatic issues that can be addressed immediately within recordkeeping informatics, stretching from better vendor resource management to implanting the basics of records capture and archives formation within internet-based business applications. It is time to revisit the idea of Archives and Evidence Commissions or work units through the prism of the new reality, the postcustodial archive in which information can be stored here, there and everywhere and yet be trusted and trustworthy.

9.4 Techniques, Technologies and the Postcustodial Archive

What are the alternatives to handing the future over to information amateurs? Can the information-based groups in the twentieth century that tried to create professional identities reassemble within the simple whole of information professionalism while developing specialisations that can in their own way address the deep and expanding complexity of the parts? Who knows, but one litmus test will be whether we start to see the emergence of postcustodial archivists and records managers within a specialisation such as recordkeeping informatics.

We sketched the development of postcustodial thinking at the conclusion of Chapter 5. The postcustodialists were harbingers of cloud computing. Today we can see the technical base for the formation of archives during the

transaction of business in action. Increasingly, in all areas of life it seems there is an essential app to be downloaded from a store in the clouds. That app is relied on to conduct the transactions required, then to store recorded information of use to them or arising from them back in the clouds using banks of storage units. In the postcustodial archivist's models, however, the focus was upon authoritative information resource management. They hoped that the traditions of the archivists would not disappear but would be transferred into nanosecond archiving within electronic recordkeeping processes. At present, however, records management and archiving processes are being fundamentally reshaped, but in chaotic fashion, and the postcustodial archives is arriving with inadequate attention to issues relating to the capture of quality records or the formation of useful archives. Cloud computing is based almost purely on the productive and storage power of modern information and communication technologies, ignoring much of the potential that postcustodial archivists began to see in the future.

9.5 Professional Competencies

The encroachment of amateurs should be causing a rethink of just what it means to be a recordkeeper (whether records manager or archivist) in this century. Some elements of the tasks dealing with paper records will continue, but our old service models, which so often focused upon managing the thing rather than the process, have collapsed. Meanwhile new information service-oriented architectures have galloped on without much regular or significant recordkeeping-based input. In the last half of the twentieth century meaningful contact with the changing information and communication technologies was lost. With it, the traditional emphasis upon authoritative resource management, which most of us intuitively understood in paper-based information ecologies, was also lost. There was a decline in required recordkeeping skills and knowledge needed to connect recordkeeping informatics with operational processes, the formation of evidence, changing retrieval processes, new imperatives to find common ways of managing active and inactive records, ways of creating records that have integrity, and our organisational cultures, business process analysis and archival access. These should be single-minded professional tasks and simply handing them over to business and systems analysts within changing information and communication technologies was never going to work adequately. The work objectives of these analysts are likely to be elsewhere. Relying on those doing the work to specify what recordkeeping is needed is to assume that they still

have intuitive understandings of the relationship between records and their tasks. That is not likely to be the case.

New standards for professional recordkeeping competencies are needed along with new ways of expressing recordkeeping functions. The detailed functions and competencies for recordkeeping informatics in digital recordkeeping ecologies for business applications will include the following:

- The way that the storage of information objects can be both fixed in time and place and also fluid as they alter during reuse;
- Mechanisms for making archival access as automatically controlled by recordkeeping metadata as possible;
- The application of metadata for the formation of self-authenticating records during business processes,
- And for self-authenticating records as automatically as possible, to take their place within corporate stores (archives).

Information culture will affect the way we apply our skills and knowledge and, while we can never escape it, it can also result in us getting many things wrong. Consider, for example, the issue of the cultures that led to the necessity in some minds for the leak of information via WikiLeaks or the cultural silliness of some of the blunders involved in providing Edward Snowden, a whistle-blower, with so much information.

Our problem here is not with big data, although many people do have problems with its scattergun uncertainties, or even with the unacknowledged gathering of metadata about all our communications. Our problem is with the apparent absence of a recordkeeping single mind in those security agencies that are charged with making us more secure. Given that recordkeeping used to be the lifeblood of intelligence, surely Edward Snowden has exposed a deep systemic problem. In a digital recordkeeping ecology where you can keep and scan billions of things, we have intelligence employees who do not seem to know about information representation, recall and dissemination issues if it relates to the trees in the forest. Taken together, our three facets of analysis and two building blocks form a kind of kaleidoscope, layering and interweaving professional competencies and functionality to produce a coherent whole. Those competencies and the functionality underpinning recordkeeping informatics are not fixed and immutable and need restatement in our new digital world, including, very obviously, restatement within the constructs of intelligence gathering.

The professional competencies that will support the framework that is being explored in this book have yet to be defined to the level of granularity

that is most useful. A starting point will be to re-examine the many existing lists of archives and records management competencies and functionality in different jurisdictions that have been compiled over the last few decades, and to map those against the recordkeeping informatics facets and building blocks. At the same time, there is a danger of over-reliance on taxonomies of skills and competencies. Sitting above the competencies there is an overarching view of professional recordkeeping functionality that in the paper era was codified under terms like appraisal, description, classification and preservation.

If we see the separation of archives and records management of the last fifty years of the twentieth century as traditional, then many activities in both areas disappear in digital ecologies. In particular, the focus on objects as opposed to process does not reflect the reality of today's technological workspaces or workplaces. For example, a 'traditional' records management survey of records is different from a workflow, enterprise architecture or service-oriented analysis, and within business and systems analyses of these things the recordkeeping single mind is usually absent, except in terms of a reference here and there to records as an end product. Records need to be an essential part of the ongoing processes. Conventional inventories may still be applicable in certain circumstances, but compiling an inventory of this type should now be considered as a forensic recordkeeping task. In contrast, clinical recordkeeping tasks should involve understanding and being able to analyse business processes and workflows that will provide the way to identify points where decisions are made and, therefore, where records are generated and reused. If these business processes are fully understood and the analysis is maintained, recordkeepers will no longer be in the position of reacting after the fact.

We hope that all those involved in any reconsideration of professional competencies and functionality will not only help develop new views but will keep an eye out for useful teaching and training exercises, be prepared to write new case studies, and be prepared to find ways of sharing those exercises and studies. Collectively, those interested in developing recordkeeping informatics should be looking to uncover what competencies and functions from our past can be rebuilt for the digital era both globally (that is, in any implementation environment) or locally (in particular implementation environments).

In the digital era, what is new, what is old, and what is both new and old? Convergence is new and old. Until about fifty years ago almost all of our recorded information about our transactions converged into one single

storage medium – paper – and our number of transactions in that medium was expanding exponentially. Now it is converging into digital media, and the expansion is even more clearly exponential. The framework set out in this book will help teachers, trainers and practitioners rewrite recordkeeping competencies and functionality within the newness of convergence. In addition, we need to find ways of getting beyond the mental gymnastics of newness within the identification of recurring patterns for the formation of archives.

9.6 Returning to the Single Mind

There are many social, cognitive and technical reasons why the postcustodial movement of the early 1990s was a premature development. The technologies had arrived but not the information professionals to implement them more authoritatively. It is time to rethink the concept of postcustodial archives and put trusted third-party storage arrangements on every information professional's agenda, along with the need to think about both the archival multiverse (the monistic whole that is the expanding continuum of recorded information) and the much greater complexity of the multiverse's parts (the monadic level of evolution).

The multiverse as conceived by philosopher William James and its plasticity and moral indifference is discussed in Chapter 6. The use of internet technologies is creating exactly the sort of multiverse that William James, in the interests of religious belief, was observing within the spacetime continuum thinking of the era, one which is massively generative but needs ethical control. James' own fears of the spacetime continuum were given concrete forms when scientists used Einstein's concepts to develop nuclear weapons of mass destruction.

The moral dilemma of the nuclear scientists of the 1930s is now reflected in many moral dilemmas posed by the expansion of the records continuum into Keen's 'inegalitarian, comprehensively surveilled' world. It will be the job of the information professional to give it some regular shapes, help import ethics into it, and press for the development of new institutions, including voluntary ones, directed at the sort of role that could, for example, be developed within Archives and Evidence Commissions and their organisational counterparts, archives and evidence units, both of which will need to direct much of their energies into managing cloud computing.

At the monadic level, archivists and records managers in their discourse should not shy away from their professional responsibility to work out ways

of looking at the complexity of the parts from a 'single-minded' authoritative resource management perspective. Many professional perspectives might be needed, but the recordkeeping single mind is the one that seems to be most often missing at present.

Accordingly, for the purposes of this book, the work units are the key point for developing recordkeeping informatics, precisely because they will be at the sharp point of evolutionary complexity. That is where there is a need for information professionals that can look complexity in the eye, can challenge the technical mysticism of vendor marketing techniques such as the cloud, and can seek out with other information professionals new ways of internalising the capture of records and the formation of archives within internet-based business applications. There is an immediate reason to create such units within organisations or consultancy groups if we are to achieve better vendor management in relation to the storage of information about business actions, and there are enough people who are beginning to understand agile computing and web-based applications from an informatics perspective rather than merely a technical one to take this business application approach. Potential cloud computing service providers should also be building up their in-house archives and evidence knowledge and skills if they are to aspire to be trusted third parties in business transactions and records storage.

Wherever they are located, the units need to be building up organisational and professional understandings of the need within modern service architectures. This can make access to records of action and the entwined issues represented in its knot of complexity one of the most exciting and dynamic facets through which to explore recordkeeping informatics and it can promote the re-emergence of professionalism in an age of internet amateurism. It is from within the processes of our application that one can begin to bring the expanding and cascading flow of information about our actions under more adequate control. Control can be introduced on an application-by-application basis, using the recordkeeping facets of analysis and building blocks we are outlining. It will never be being done perfectly, but that is no excuse for not trying to restore some order into the inherent chaos of our ever-expanding powers of building and storing electronic memory. It can take us in the direction of adequate information governance rather than just to firewall and jail-the-messenger style solutions.

The units can feed information and experience into a network of new resourcing and regulating agencies such as Archives and Evidence Commissions as well as the older network of custodial archival institutions.

The network will need to address the creative destruction of centuries of diplomatic development within the paper era, which in Europe spread out from the notary tradition and the development of the legal profession and archival institutions. The emphasis upon the documentary form within that tradition will continue into the future (for example, for email and for countless legal and business forms), but many issues for the proper use of individual referents are now connected to the document's part in the flow of documents and their aggregation, requiring the reinvention of archival diplomatics within newly forged communication and transaction protocols.

Archival diplomatics itself was based on a constant and evolutionary process of social negotiations. The global disruption of those patterns sets up new negotiation needs. Email provides a classic example. Hacking attacks repeatedly demonstrate just how vulnerable email is, despite the building of firewalls. Email form and its management so far have tended to mirror the paper era, and organisations have not yet developed authoritative systems that give due respect to the technical changes that have been occurring. More often than not, email is managed purely as an allocative resource, which, as a second system involving the loose interchange of ideas within a system all contributors know is vulnerable, would be a useful tool, but, as a tool for doing business, is genuinely pathetic. Perhaps the answer is two systems – an allocative one and an authoritative one – with a shared interface. The authoritative component will be less vulnerable because there will have been much more business application-based attention being paid to access and cloud control and less dependence on failing approaches such as firewalls.

In the same way, it is possible to imagine an allocative and an authoritative internet. At present, its form has had only a short period of time to evolve and its control is based upon colonisation by superpowers such as Microsoft and Google and social media entities like FaceBook and Twitter. This fragmentation of the allocative internet will continue as new colonisers emerge and compete for power. Meanwhile, revamped forms of information professionalism can focus on the authoritative Internet, one which forms a stable hypertext framework for cascading documents while protecting our mutual associations, spacetime management, and life-chances – in other words, one which makes contact with a neglected and largely unimagined area of internet potential.

Organisations like Archives and Evidence Commissions can help facilitate the transition as well as develop auditing techniques and policies for cloud control purposes. Jointly, the commissions and archives and evidence

units within organisations and consultancy companies can develop trusted third-party monitoring and auditing techniques, providing a major revenue stream for new services in an area that desperately needs such services. This role would be part of their joint responsibility for promoting an informatics style of information professionalism that addresses the social role of technology, its place in knowledge formation, and the techniques and technologies of human–computer interaction.

This is still a dream. Currently information professionalism cannot support the development of such sophisticated approaches, and amateurs thrive and prosper in cloud environments. As we argued earlier, information workers need to start making comparisons with the two strongest of the professions, medicine and law, where a broad view of the role of each profession provides monistic coverage for the vast monadic complexity of what is going on within the parts. In terms of the old view of information professionalism, the information specialisation, each specialisation needs to adjust to cascading information, but this should be based on a singularity within the plurality of information specialisations.

In our case, the singularity is the recordkeeping single mind and it can be rebuilt around the postcustodial archivist's ideal from the 1990s of rebuilding archival functions and services for an era of electronic memory. What, for example, can happen to the traditional archival custodial functions of appraisal, provenance documentation, storage and preservation in a world where custody is here, there and everywhere and has to be applied to expanding cascades of information about our actions? Longstanding archival questions and practices need to be reframed and the next chapter continues to explore what needs to be done to build the disciplinary base for recordkeeping informatics.

BUILDING THE DISCIPLINE BASE

10.1 Introduction

Having presented our framework for digital recordkeeping informatics, it is time to return to our original desire to create a replacement text for the second edition of a textbook on recordkeeping written by Jay Kennedy and Cheryl Schauder.¹ With the assistance of Barbara Reed, that book had absorbed the development of the 1996 Australian Records Management Standards, particularly AS 4390/1, the standard that went on to provide the basis for international standards. It provided many useful teaching and training exercises and case studies. It was, however, targeted (like the standard) for the multimedia nature of records in a pre-digital convergence era and we formed the opinion that, in these times of exponential change, we needed to redesign the disciplinary base and then assess what teaching material had continuing relevance.

Our approach has been as basic as we could manage, given that this is a research publication exploring and defining recordkeeping informatics. We have introduced the concept of recordkeeping informatics and outlined an approach to its implementation in organisations, arguing that more efficient, effective, reliable and sustainable records management comes from understanding and appreciating the informatics; it comes from knowing not just about managing records, but also about managing the recordkeeping systems and processes in which they are created, captured, managed and consumed. We built our argument around two building blocks and three facets, urging those responsible for the management of current records to accept the challenges of the digital environment and, in

1 Jay Kennedy and Cheryl Schauder, *Records Management: A Guide to Corporate Recordkeeping*, 2nd ed. (South Melbourne: Longman, 1998).

so doing, to actively engage in reshaping and broadening their philosophy and approach.

One of the building blocks, continuum thinking, helps explain why we think the old base needs deconstruction and replacing with a new base. As we have emphasised throughout this book, in recording information about our actions we are being brought face to face with what Gabriel Tarde described as a ‘confusing plasma composed of myriads of monads, a chaos, a brew’.² Never before have we been faced with such a rapid expansion of complexity within which to make our decisions, with more ambiguously constructed types of evidence to use in that decision-making and with more testing regulatory tasks ahead of us in relation to access to recorded information to enable more participatory processes in that decision-making. Yet Tarde also argued for the existence of a simpler whole, a continuum in which everything is involved in some way in the composition of everything else. That simple whole in digital recordkeeping is now perceived as being in the clouds, probably the most significant breakthrough in information storage ever.

We have repeatedly referred to chaos and complexity as distinguishing features of today’s workplace and society. Analysing the systems in such an environment, scientists Jack Cohen and Ian Stewart have developed the ideas of simplicity and complicity:

Simplicity is the tendency of simple rules to emerge from underlying disorder and complexity, in systems whose large-scale structure is independent of the fine details of their substance. Complicity is the tendency of interacting systems to coevolve in a manner that changes both, leading to a growth of complexity from simple beginnings – complexity that is unpredictable in detail, but whose general course is comprehensible and foreseeable.³

The concept of a single-minded recordkeeping approach, applied within complex, chaotic, and contested fields of practice, represents simplicity. Complicity is our aspiration to coherent and consistent theoretical frameworks brought into specific tasks in a consciously evolutionary manner across a professional group of practitioners.

2 Cited in Bruno Latour, ‘Gabriel Tarde and the End of the Social’, in Patrick Joyce (ed.), *The Social in Question, New Bearings in History and the Social Sciences* (London: Routledge, 2012), 117–132.

3 Jack Cohen and Ian Stewart, *The Collapse of Chaos: Discovering Simplicity in a Complex World* (London: Penguin, 1995), 3.

Getting there sounds like an impossible task, but this book argues otherwise. Having rewritten what we think is a coherent overview of recordkeeping for the first half of this century, the next stage in development is to develop the discipline base. This can include going back to texts like that of Kennedy and Schauder and looking for the babies and their bathwater; distinguishing one from the other is crucial.

The bathwater is usually any approach that is too topographically specific to past times and places. In archives and records management this book has discussed a lot of bathwater, signaling a degree of difference from the established approaches to the management of current records worldwide. It has clearly acknowledged the central role of changing information systems and technologies. It provides a clear point of departure from the philosophy that the principles to be applied to digital records are exactly the same as in the paper world. They are not, and attempts to apply them have resulted in frustrating failures.

In contrast, the babies are the topological elements that have relevance to different times and places. The application might be different, but the logic is constant. All our ‘babies’ are connected to authoritative resource management, to the better management of issues and events over spacetime. For example, as we discussed in Chapter 2, when many organisations in Western democracies moved to top-down goal-setting approaches in the 1980s and began to take advantage of the massive and expanding power inherent in the increased production of information, they often also threw out Weberian understandings of administration. They went too far. Poor recordkeeping can lead to failures and we should not ignore the need to maximise the application of new technologies to the formation and use of evidence.

We need to reconnect with the logic of authoritative resource management. A recurring theme in this book has been that, if we continue to ignore recordkeeping informatics, our forms of administration will grow weaker and weaker. Recordkeeping will always remain a major determinant of the health and nature of any organised society, individual, or group. As the International Records Management Trust has argued ‘Trustworthy and accessible ...records are the means of demonstrating transparency and accountability; they are the legal foundation upon which openness is built.’⁴

4 International Records Management Trust, *Open Government and Trustworthy Records; International Regulatory Framework and Capacity Benchmarking Tool*, 2013, Available at <http://www.irmt.org/portfolio/open-government-trustworthy-records/attachment/benchmarks-for-open-government-and-trustworthy-records-final-2> (accessed 17 October 2016)

Calls for open data and open government, however, are simply empty rhetoric if not underpinned by recordkeeping practices that live up to the promise of the rhetoric.

On the one hand, there is increasing awareness of information; even metadata is finding its way into news bulletins and political speeches, thanks to Edward Snowden's disclosures of the National Security Agency's surveillance activities. We argue though that promoting too superficial a view of information and its means of production takes attention away from how poorly the information might have been formed as evidence. Information might be power, but it can also be pollution, spreading across our activities like sludge.

That scepticism about the information age in no way involves a denial of the obvious reality that modern information and communication technologies are an overwhelming allocative success, giving us productive techniques far beyond anything we could imagine in the past. They have also, however, established a wild frontier that has overwhelmed authoritative information resource management. Accordingly, we have been trying to open up a conversation about how to use the technologies to develop some stability within the formation of evidence and collective memory in ways that support such things as:

- the spacetime management of events;
- our life-chances;
- the management of our mutual associations;
- the way we govern our activities;
- the way we form and use evidence to make decisions;
- and the investigation of past actions.

This chapter considers the following critical components required to establish a new discipline base, namely the need:

- for new professional groupings and new occupations;
- for new people with a new range of skills and knowledge;
- to operate within ethical organisations that possess the clichéd but far too rare understanding that the imperative in this century is to seek out 'win/win' outcomes;
- for recordkeeping informaticians to occupy roles within project teams and to provide recordkeeping services that no-one is asking for yet.

We hope to show that, while this seems like a fanciful wish list, these needs are real. To bring about change in these directions, trainers and educators need to start developing suitable exercises and cases studies from the sort of reinvigorated disciplinary base that we have argued for in these pages.

10.2 The Topology of the Oldest Profession

Recordkeeping informatics, as a term, is clearly process-oriented and we want to be clear about where the emerging discipline's primary focus should reside. It is upon the technologies and systems for managing information objects in cyberspace. During this period of transition, authoritative resource management is suffering and, perhaps, as we argued in Chapter 2, a crisis is needed if we are going to see more clearly the need for new jobs to ensure evidence formation and retention.

We asked whether that crisis is indeed becoming obvious generally and whether it exists in your time and place. One place to look for signs of trouble is whether there is a crisis in terms of employment opportunities for records managers and archivists. The amount of recorded information about our actions is increasing exponentially. Are the professions that in paper-based information ecologies were charged with roles in relation to storage and access of information about our actions also expanding, or are they declining in significance? Are we becoming less certain of what future employment opportunities exist for information professionals and can they develop networks across specialisations that can re-invigorate them?

Major changes to technologies as a means of production will always attract new occupations and take attention away from old ones. Occupations and even professions come and go. Blacksmiths and saddlers are now relatively rare occupations, whereas in the nineteenth century every small country town had one. According to Andrew Abbott, professions arise as a result of system disturbance and will then establish jurisdiction over a problem. As there are constant disturbances within society, there are continually changes in demands on occupations and consequently competition for jurisdiction.⁵ In the mid-1990s Van House and Sutton noted that library and information science was engaged in competition for jurisdiction with other information professions, due firstly to changes in computing and telecommunications technologies and secondly to the increasing strategic

5 Andrew Abbott, *The System of Professions: An Essay on the Division of Expert Labor* (Chicago: University of Chicago Press, 1988).

importance of information.⁶ Since that time, the rate of change has intensified, resulting in a complexity in the information environment that is difficult to comprehend, let alone manage.

Formerly, the literal 'keeping of records' was often the dominant activity for paper-oriented records managers and archivists. That meant keeping tangible things on shelves in their repositories. Now, there are fewer jobs involved with managing paper, and these jobs will not be replaced one-for-one by roles solely concerned with the physical storage of the much more concentrated forms of electronic and digital media. There will always be some reminders of the paper-based era in the form of paper itself and in retrospective digitisation projects converting that paper. There is also still a present need to convert paper as it is received in our organisations, but the jobs these activities entail will decline in numbers and will steadily become even more routine.

So, are we witnessing the collapse of records management as a distinct disciplinary construct? How are the records management professional associations responding to this crisis? In Australia and New Zealand we appear to no longer have a distinct and identifiable records management association. The Records Management Association of Australasia has rebranded itself as Records and Information Management Professionals Australasia (RIMPA), suggesting an amorphous and potentially unbounded scope. Perhaps this reflects the way the front-end of archival formation is now occupied not by records management but by new forms of informatics dominated by information management and systems techniques.

Returning to babies and bathwater, this suggests a desire to discard or undervalue the key component of authoritative recordkeeping. Claiming jurisdiction over the contested domain of information without a strong recordkeeping element means that RIMPA has little to contribute. What will happen to RIMPA when society's recordkeeping needs relate almost entirely to what we now call 'born-digital' information? Will RIMPA's current focus on tasks like imaging as a physical means of production kill off the records management professional group that once led the world in producing standards that addressed authoritative resource management? Alternatively, will recordkeeping professionals in Australasia be forced to make their own claim for jurisdiction by forming an evidence-based professional association?

6 Nancy Van House and Stuart A. Sutton, 'The Panda Syndrome: An Ecology of LIS Education', *Journal of Education for Library and Information Science* 37.2 (1996): 52–62.

One claimant for authoritative resource management-based jurisdiction, the archival profession, is still strong globally. In Australia, however, it has its problems. There is some chance of the Australian Society of Archivists (ASA) disappearing, as the records management association has done, but for different reasons. Economics (the financial clout of the imaging industry) has motivated the rebranding of records managers, but the ASA has been undergoing the financial constraints of a non-expanding membership base. The ASA had been over-managed when it needed to go back and draw upon the strong spirit of volunteerism that still exists amongst its membership. For a time it struggled to support even its conferencing and publication role. While the ASA can still raise the level of scrutiny of heritage, accountability, and transparency issues (the source of much of its voluntary spirit), its public profile is that of a small fish when compared with activist archival whales like WikiLeaks.

This account so far is pessimistic. It supports the general pessimism of other parts of the book that draw attention to how the amount of information about our actions is expanding and its management is becoming increasingly chaotic. Humanity, however, has a habit of adjusting when its future and countless survival issues are at stake. We all depend upon authoritative resource management, and a discipline like recordkeeping informatics can be seen as beneficial to both archivists and records managers while making a modest and targeted claim for jurisdiction in a vital area where genuine competition is slight. It provides an opportunity for:

- records managers to establish themselves as an integral and indispensable component in organisational recordkeeping within changing times;
- archivists to become significant players in advising on the way the record is formed in the first place;
- and teachers and trainers of recordkeeping professionals, such as ourselves, to regroup.

This regrouping reminds us of the topological view that the abiding professionalism of recordkeeping as our structured way of going about the formation and maintenance of evidence makes it the oldest of professions. Recordkeeping used to be characterised by a single mind, but we divided the role into records management and archival administration and now have to grapple with multiple personalities beyond those two groups. The logic of recordkeeping, however, goes back to cave painting, to tribal ceremonies, and to our earliest ways of formalising our trading processes. It underpinned the

emergence of other professions. A doctor is a professional because the development of recordkeeping meant that there was a body of knowledge they could use. Lawyers were an outgrowth of recordkeeping, emerging in part from the role of notaries and of government archives as places of deposit for legal agreements. Accountancy is founded on recordkeeping – the consequences of accountancy without robust recordkeeping are catastrophic.⁷

The problem with establishing and promoting recordkeeping in a time of exponentially expanding complexity is that it is too basic and too fundamental. It has become hidden within other professional activities. All professions, however, have the challenge of regaining control of our expanding information and communication technologies and no longer have the innate understandings of evidence that used to exist in the world of paper. We have gone from a situation where recordkeeping was performed adequately and naturally in many areas of our life to one where it is often done badly, if at all. Scientists have had to deal with more and more disagreement about where to look for evidence and what it means (for example, the climate science issue). Governments develop policy that is not evidence-based.⁸ Companies can no longer be trusted to universally seek out accountants who will not cook the books. Health and medical informatics has been a useful response to complexity and legal informatics is emerging, but all our adaptations would be quicker if we did not have to individually reinvent a common base for identifying recordkeeping precedents, patterns, and procedures in modern information environments and began to regain some human consistency across recordkeeping strategies, systems and structures.

What sort of reinvented positions will these new professionals need to occupy? From our past, one position that should be looked at closely is that of the registrar. Registrars were those key bureaucratic figures built around the concept that organisations are bundles of activities. They managed the reception, handling and dispatch of correspondence relating to incoming and outgoing business in a period that saw the expansion of colonial and bureaucratic structures based on recordkeeping. These days we need [recordkeeping] metadata registrars, professionals who can look at any

7 Jane Gleeson-White, *Double Entry: How the Merchants of Venice Shaped the Modern World – and How Their Invention Could Make or Break the Planet* (Sydney: Allen & Unwin. 2012).

8 Peter Gluckman, *The Role of Evidence in Policy Formation and Implementation: A Report from the Prime Minister's Chief Science Advisor* (Wellington: Office of the Prime Minister's Science Advisory Committee, 2013). Available at <http://www.pmsa.org.nz/wp-content/uploads/The-role-of-evidence-in-policy-formation-and-implementation-report.pdf> (accessed 7 October 2016).

metadata scheme and identify and implement elements within them that can use time to conquer time, capturing details of specific occurrences that turn information into evidence.

We also need to reinvent records analysts, creating people that can carry out multifaceted analyses of organisational, business and access recordkeeping. They will still have to identify when and where records should drop out as end products of our processes, but the task is to make records and evidence part of the effectiveness of all operational activities when they need to be.

Beneath the registrars and analysts there will be a diminishing number of positions looking after records and archives as physical products (things to be shelved or imaged). The total number of recordkeeping positions, however, should start expanding once we start identifying and codifying the work of the growing number of people that should be involved in the cyberspace-based management of evidence. What the positions will have in common is that their professional attachment involves being stewards for authoritative resource management when it is needed, and this, not allocative resource management, is the key to identifying and building up the workforce of people who can help curb the wild frontier. Furthermore, we have to broaden thinking, to move beyond our current focus on a narrow competition for jurisdiction with cognate professions to be able to recognise and advocate for a range of specialist roles within recordkeeping. This will enable us to position recordkeeping appropriately in conjunction with other information management specialisations. Just as the much older profession of medicine has developed different roles to provide generalist and specialist perspectives, so must a developing informatics professional grouping be based on expanding specialisations.

A critical concern for us though is how to demonstrate the necessity of recordkeeping expertise, to establish the value proposition. What is the profit motive? Leaving aside the ethical elements of proper recordkeeping and how they can lead to win/win solutions, the profit comes from the administrative efficiencies of adequate recordkeeping and the decline in money spent on fixing up mistakes.

10.3 The Topography, with an Emphasis on Non-recordkeeping Topographies

By using the phrase recordkeeping informatics rather than records management or archival administration we have been trying to convey the message that the issues and challenges of records are not simply the purview of a

distinct occupational group known as records managers or archivists. In the previous section, we conjectured that a few core authoritative resource management positions will emerge, such as recordkeeping metadata registrars, and that a group currently far too slight in numbers, recordkeeping systems analysts, will become a more noticeable part of the workforce. The scope of practitioners concerned in one way or another with this area, however, will also include information architects, developers, and business analysts. Any information professional becomes relevant to recordkeeping informatics the moment they start to consider how to use time to conquer time.

In extending that logical view of the oldest profession we need to address in our teaching and training the topographical needs (that is, the needs of particular situations and workplaces). Our stewards for authoritative information resource management will still need to work to logical models and conceptual underpinnings such as those set out in this book. Collectively, at master plan level, they need to be able to identify patterns for the development, selection, and agile management of recordkeeping applications. Beneath that logic the development of analytical skills relating to organisational cultures, business process analysis with a recordkeeping twist and archival access can help us develop floor plans for implementation – the topography of recordkeeping.

On the other hand, there is a lot more than recordkeeping master and floor plans needed for recordkeeping informaticians to get into a position where organisations will allow them to reflexively adjust those plans when necessary. Situations where change is needed will include those where threats to adequate evidence of our actions come from localised over-enthusiasm for information as a product without regard to its quality. Can our recordkeeping professionals fill in the architectural gaps in authoritative resource management in any organisation as those gaps become apparent? Can they stand outside complex situations and see those situations for what they are, difficult but not necessarily unmanageable?

Even if they can do these things, the knowledge required in our new disciplinary base must encompass:

- the way authoritative resource management has been subordinated in particular workplaces to the expanding productive capacity of our information and communication technologies;
- the demands upon leaders in the workplace to master many complex information and communication tasks that are not in themselves based on the logic of their native expertise;

- and the way the demands of cyberspace are often irrational, setting up a whole range of new communication- and information-based skills that can help you be heard above the babble, or even just become part of the babble.

In other words it will take more than a logical and confident professional effort to address the subordination of authoritative resource management to allocative resource management, even if we had logical and confident practitioners in abundance. The demanding set of skills and understandings set out in this book need to be combined with a wide range of additional skills, many of which are indeed allocative (that is, related to the means of production) and can also be labeled reflexive. Reflexivity beyond the basics of recordkeeping informatics requires people who are, among other things:

- capable of analysing legislative mandates as they shift around us;
- ICT literate, with an awareness of emerging trends of different times and places, such as the present-day shift to agile computing;
- equipped with diagnostic skills that they can apply on the run;
- able to engage with people;
- capable of succinct and meaningful explanations of recordkeeping, the ‘three- minute elevator speech’ tailored to whoever is in that elevator;
- aware of who holds the power in their workplace and its strategic direction, with understanding of financial support and resource allocation;
- effective in their networking with others who are (or should be) interested in authoritative resource management;
- enthusiastic but purposeful participants with digital technologies and social media;
- equipped with graphic skills and other technical skills in communication;
- able to be active listeners.

These are valid teaching and training needs that have to be addressed and combined with professional skills and knowledge.

These non-recordkeeping skills are important to the situated application of recordkeeping informatics. They matter every bit as much as recordkeeping logic. For example, as we have already pointed out in this chapter and argued in more detail in Chapter 2, Australian records management gave us

international standards and the second edition of Kennedy and Schauder's textbook on records management. We liked its logical base, but we dropped the attempt to update it once we realised how much things have changed in the workplace. We have to respond to the often irrational and usually dynamic situational demands in ways that are more reflexively adequate.

If the situated challenges to logic can be considered recordkeeping's special relativity there is also a general relativity problem. Logic is not enough. Even when it might seem to be impeccable, its impact might be deleterious. For example, the archival profession has to find ways of coping with the convergence of what is referred to as the GLAM (galleries, libraries, archives and museums) industry. Logically there are many general economic and performance-based benefits that can accrue from this convergence. The movement, however, can be used to downgrade by stealth the status of once great national institutions by claiming to use amalgamations in progressive fashion while in fact isolating them jointly into a culturally narrow sleeve of activity. In this case the logic of convergence has to be pursued but its application could destroy existing specialisations, whereas the actual need is to jointly extend those specialisations out across the convergence, as we argued in Chapter 6. Recent high-profile convergence activities have occurred at national level in Canada (Libraries and Archives Canada) and in New Zealand, with the subsuming of Archives New Zealand and the National Library of New Zealand into another government entity, the Department of Internal Affairs. These initiatives are motivating academic research,⁹ but the political nature of these government decisions means that their consequences cannot yet be fully explored or exposed. Before the results are in, however, is it realistic for us to argue for the emergence of evidence-directed recordkeeping professionals operating across the divided categories of records managers and archivists. The RIMPA and GLAM convergences have their attractions. Do they really need to endanger the purposes for establishing specialisations in the first place?

9 Notably the research of Shannon Wellington, 'Building GLAMour: Converging Practice Between Gallery, Library, Archive and Museum Entities in New Zealand Memory Institutions', PhD thesis, Victoria University of Wellington, 2013, available at <http://researcharchive.vuw.ac.nz/handle/10063/2835> (accessed 17 October 2016), presentations from Julianne Molineaux, for example <http://www.ikebarberlearningcentre.ubc.ca/juliennemolineaux/> (accessed 17 October 2016), and W. Duff, J. Carter, J.M. Cherry, H. MacNeil and I.C. Howarth, 'From Coexistence to Convergence: Studying Partnerships and Collaboration Among Libraries, Archives and Museums', *Information Research* 18.3 (2013), available at <http://InformationR.net/ir/18-3/paper585.html> (accessed 17 October 2016).

What we are certain about is that recordkeeping has been losing ground within the processes of convergence and it is now time to reverse that trend. We do not have any simple answers or exceptional insights into the future that can make us confident of success; as an historian once joked, it is hard enough to predict the past. Whatever happens, however, we believe that our associations, institutions, and educators with an interest in authoritative resource management should be doing their utmost to train and educate recordkeeping professionals as representative of the oldest and newest of professions, recordkeeping informatics. To do otherwise is to opt out of their responsibilities to use recordkeeping to help in the conquering of time. Whether practitioners are called archivists, records managers, RIMPAs, or GLAMs, they will need, at appropriate times, to be carriers of a logical recordkeeping single mind while accepting both the recordkeeping and non-recordkeeping topographies within which they will be operating.

10.4 Ethics and Professionalism

Earlier we introduced the concepts of simplicity and complicity, which when considered in terms of establishing a new disciplinary base leads us to articulate the need to develop people that can manage both the forest and, when necessary, the trees in the forest.

In pointing to problems at holistic levels throughout this book we have raised the spectres of climate change, environmental damage, the spread of terror, corruption, the decline in confidence in our governments, and the problems of poverty, inequality in the distribution of wealth, famine, and economic collapse at a time when growth in general wealth, humane food production and improved economic stability should not have been difficult to achieve. Sceptics might argue that we are being alarmist for our own purposes. We would argue that all of these are primary problems, and that some of those who would deny them might be potential nominees for what the Australian journalist Annabel Crabb has called the ‘Global Institute of Shamelessness’.¹⁰ For example, we have had a very vociferous minority of people denying various aspects of climate change evidence. They have been led by elements of the Murdoch media empire and some lobbyists for the mining industry. The former United States Vice-President and Nobel Laureate, Al Gore, has

10 Annabel Crabb, ‘The Surprise Part Rumbles On, and Only a Shameless Act Will End It’, *Sydney Morning Herald*, 1 December 2013. Available at <http://www.smh.com.au/entertainment/the-surprise-party-rumbles-on-and-only-a-shameless-act-will-end-it-20131130-2yir.html> (accessed 17 October 2016).

likened the situation in Australia to the tobacco lobby last century, which at first denied the connections between cigarette smoking and cancer.¹¹ Once the links could not be denied they fudged the issues, finding many other factors to blame while striving to maintain their untrammelled profit-making for as long as possible. If we do not have a global approach to the production of adequate archives to prove or disprove arguments about the impact and causes of global warming, this type of stalling tactic can continue on for decades.

The challenge of global warming may seem remote from day-to-day workplace issues, but, on the contrary, it provides a standpoint to consider ethical organisations, and to consider how serious the problems with evidence formation are in different times and places. It is not just the big survival issues where we need to teach and train people to seek out recordkeeping solutions. It applies to everyday administrative tasks. Again, throughout this book we have been pointing to examples of poor administration, including the belief of some officials and politicians that Iraq had weapons of mass destruction, the cemetery that lost track of where the relatively recent war dead were buried, and the home insulation scheme that led to houses burning down and untrained installers electrocuting themselves.

Once awareness is raised of administrative blunders and slip-ups, the inevitability of concurrent elementary recordkeeping failures never ceases to surprise. We are convinced that the examples of poor administration that we regularly uncover in Australia and New Zealand are likely to be systemic. They will seldom stem from human error alone. The cause is more likely to be an absence of recordkeeping knowledge and skills. Weber got the relationship between recordkeeping and administration right, but as we argued in Chapter 2, because of our fear of red tape, we have thrown his baby out with the bathwater of excessive regulation. There is, in theory, a cast-iron connection between sound administration and good recordkeeping that can clearly justify the employment of recordkeeping informaticians.

There is, however, no long-term advantage in simply pointing to the theoretically reliable connection between adequate recordkeeping and administrative efficiency. The argument might grab some attention, but, without practitioners who can actually deliver more adequate forms of recordkeeping, the situation is hopeless. Our interventions are likely to be seen as

11 'Al Gore Attacks Tony Abbott's Refusal to Link Bushfires with Climate Change', *The Guardian*, 24 October 2013. Available at <http://www.theguardian.com/environment/2013/oct/24/al-gore-attacks-tony-abbotts-refusal-to-link-bushfires-with-climate-change> (accessed 17 October 2016).

needlessly putting red tape in the way of action and as impediments to achieving workplace goals.

Returning to the management of the simpler whole, there are major ethical problems hidden away in the archival multiverse and records continuum. The ethical problem with all forms of evolution was pointed to by William James, who in his 1895 essay 'Is Life Worth Living?' wrote, 'Truly, all we know of good and duty proceeds from nature ... [which] is all plasticity and indifference – a moral multiverse, as one might call it'.¹² Recordkeeping used to be a gold standard for any form of governance and administration, but, on its own, it is morally indifferent. It can serve every form of government and is particularly effective in supporting terror-based and totalitarian regimes. It can support colonial administrations more easily than it can support self-governing local activities.

Professionalism, however, has an ethical component and, for recordkeeping to serve 'a life worth living', that component should not be neglected. This is hardly a new argument. In the 1970s one of the first activists to identify in Neo-Marxist fashion that information was replacing science in societal ways of knowledge formation, Jean- François Lyotard, noted at the end of *The Postmodern Condition* that:

We are finally in a position to understand how the computerization of society affects this problematic. It could become the 'dream' instrument for controlling and regulating the market system, extended to include knowledge itself, and governed by the performativity principle. In that case it would inevitably involve the use of terror. But it could also aid groups discussing metaprescriptives by supplying them with the information they lack for making knowledgeable decisions. The line to follow for computerisation to take the second of these two paths is, in principle, quite simple; give the public free access to the memory and data banks. Language games would then be games of perfect information at any given moment. But they would also be non zero-sum games, and by virtue of that fact discussion would never risk fixating in a position of minimax equilibrium because it had exhausted its stakes. For the stakes would be knowledge (or information if you will) and the reserve of knowledge – language's reserve of possible utterances – is

12 Quoted by Tim Wilkinson, 'The Multiverse Conundrum', *Philosophy Now* 89 (2013). Available at https://philosophynow.org/issues/89/The_Multiverse_Conundrum (accessed 17 October 2016).

inexhaustible. This sketches the outline of a politics that would respect both the desire for justice and the desire for the unknown.¹³

That was Lyotard's simple solution, a holistic view that drives the work of many information activists this century using instruments like WikiLeaks. At the complex level of the monads, however, we need to work out many different ways of legitimating access whether directly, through judicial processes, through whistle-blowing, or through trusted third parties such as ombudsmen or archivists.

In other words we need much more than the work of information activists, valuable though the contributions of people like Julian Assange and Edward Snowden to democratic processes can be. Recordkeeping informatics should be in advance of their simplistic notions and noble gestures. Lyotard's premise, however, remains valid. Put simply, denial of access can lead to terror. Put just as simply, promoting access can result in win/win solutions of the type advocated by Bill Clinton, when President of the United States:

The more complex societies get and the more complex the networks of interdependence within and beyond community and national borders get, the more people are forced in their own interests to find non-zero-sum solutions. That is, win-win solutions instead of win-lose solutions.... Because we find as our interdependence increases that, on the whole, we do better when other people do better as well – so we have to find ways that we can all win, we have to accommodate each other.¹⁴

This is a viewpoint that continues to be valid at least from a liberal perspective rather than from a nationalistic or fundamentalist 'I win, you lose' view. The exponential expansion of complexity, specialisation, and interdependence is a reality we must live or die with.

One can quarantine the spread of the argument in favour of archival access by defining the relationship between recordkeeping and governance narrowly, confining the access issues to records of things we call governments. As we saw in Chapter 5, many Western democracies introduced advanced regimes for the management of more liberal access laws to

13 Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge*, trans. by G. Bennington and B. Massumi, (Manchester: Manchester University Press, 1984), 67.

14 'Bill Clinton [interview]', *Wired Magazine*, December 2000. Available at <https://www.wired.com/2000/12/clinton-2/> (accessed 17 October 2016).

government records in the 1980s, but governance is not the same thing as government. In fact, we live in an age when governments are privatising their operations to unprecedented degrees and outsourcing has become one of the ways that governments have lessened the effectiveness of these new regimes.

This puts a new focus on corporate governance and gives major significance to regulating and monitoring the recordkeeping of all agents whose activities are funded out of the public purse. Are agency contracts properly constructed and monitored in your space, or is the monitoring process descending into the world of information sludge? Without a disciplinary base like recordkeeping informatics, how can one have any confidence in what is going on? How do you even begin to know whether legal, ethical, and moral standards of recordkeeping are being observed by agents, or whether public expressions of governmental policy are being realistically followed, if recordkeepers have yet to develop reliable ways of conducting suitable recordkeeping audits? On the other hand, in the spirit of a win/win approach, do the contracts place unreasonable burdens on agents because they have been written by people who know very little about what is possible within recordkeeping practices in particular times and places?

Again, we come back to a variation of a bedrock question posed by this book. Are organisations failing to maximise the potential in our technologies to use time to conquer time? If so, the problem may at least in part be caused by the history of archivists and records managers in the last half of the twentieth century as storers of things rather than partners in the processes by which those things are formed and managed in ways that feed back into operations. The expansion in paper-based transactionality caused archivists and records managers to invest more and more intellectual and physical effort on storing end products. Responsibility for the extent to which anyone is fully capable of playing non-zero-sum recordkeeping games has to lie with our teaching and training programs.

One obvious approach to be taken in education is to focus as much as possible on cyberspace. There the singularity of the recordkeeping mind is needed from the beginning and throughout the lifespan of recorded information. There is no other way to maximise the use of that information within service-oriented architectures and across the needs and interests of all stakeholders in the authoritative nature of the record. That has to be managed across the trees in the forest, but, in doing so, we should not lose sight of the simple reality that archival access is needed to help suppress terror.

10.5 Activity-based Interventions

At a conference of archival educators and researchers in 2012, the development of recordkeeping informatics was added to the many grand challenges facing archivists. Among the particular challenges identified were:

- developing current and historical source registers (for example, for things like climate science);
- developing network maps of sources;
- building participatory network structures;
- developing recordkeeping audit processes and procedures;
- developing rating techniques with a strong justice component for ‘archivally approved applications’.¹⁵

In pursuing such challenges one of the advantages of an informatics approach is that other professions have been there before us and we can learn from them. For example, in the first article we ever wrote on the subject, we looked for and found an area where informatics has been applied in ways that suited our purposes.¹⁶ In the health-care informatics field, the issue of interventions has been codified and described in a guide by Enrico Coiera within four key areas of skills and knowledge for information and communication systems:

- understanding the fundamental nature of these information and communication systems, and describing the principles which shape them
- developing interventions which can improve upon existing information and communication systems
- developing methods and principles which allow such interventions to be designed
- evaluating the impact of these interventions on the way individuals and organisations work, or on the outcome of the work.¹⁷

15 The Fourth Annual Archival Education and Research Institute (AERI), University of California Los Angeles, 9–13 July 2012.

16 Gillian Oliver, Joanne Evans, Barbara Reed and Frank Upward, ‘Achieving the Right Balance: Recordkeeping Informatics, part 1’, *IQ* 25.4 (2009): 18–21.

17 Enrico Coiera, *Guide to Health Informatics*, 2nd ed. (London: Arnold, 2003).

The first bullet point, understanding and describing the fundamental nature of information systems, states the starting point required in any intervention. If you do not know what you are doing, don't intervene. Better – more efficient, more effective, more reliable, more sustainable – records management comes from understanding and appreciating the informatics, knowing not just about managing records, but also about managing the systems and processes in which they are created, captured, managed and consumed.

This is where we consider our three facets and two building blocks approach to be particularly useful. They provide a principled and fundamental framework for considering information and communication systems in broad organisational and societal frameworks without losing contact with complexity. Our formula emphasises the need to identify those environmental features that shape and influence information and communication systems and, in turn, to see the capacities and constraints for recordkeeping within them. These capacities and constraints raise the issues of how recordkeeping analyses can drive business processes (rather than just simply be an add-on to them) and do not neglect the most significantly neglected information management issue of our era, archival access. Recordkeeping metadata and continuum consciousness, in turn, drive the use of these analyses in managing things over spacetime.

Coiera's second bullet point might seem to be a tautology. Even if you know what you are doing, do not intervene unless you can improve upon existing information and communication systems. For recordkeeping informatics, however, that raises the significant issue of purpose. There are tens of thousands of people involved in improving the productive power of systems, but how many are involved in improving the way they form and manage evidence and help us to use time to conquer time? The interventions of recordkeeping informatics need to improve our authoritative resource management. We should leave it to others with a more relevant single mind to take the lead in relation to existing information and communication systems as the means of production of information, including the production of big data.

With the many different and ever-changing information and communication systems recordkeeping informatics professionals might encounter, what frameworks for improvement should be chosen for particular attention in our teaching and training? Our own perspective, which is not a radical one, is that, while professionals will have to deal with the information and communication systems of their time and place, web applications will increasingly dominate our transactionality. They offer an ideal platform for

improving our methods for the analysis of the cultural, technical and transactional settings for recordkeeping, in conjunction with the application of recordkeeping metadata and continuum style views of the relationships between the simpler whole (the web as a plastic and morally indifferent archival multiverse) and the complexity of its parts (the individual applications and the ethics of recordkeeping). Digital information ecologies take us into the complexity and chaos of modern information systems, but we need to keep our focus for improvements upon authoritative resource management. If you cannot see the wood for the multitude of trees in it, you are failing, and if you cannot look after the individual trees, your failure will be even more complete.

The third bullet point, developing methods and principles that allow such interventions to be designed, takes us into the need to develop a professional approach to recordkeeping informatics via a collective effort to build a discipline. Projects are particularly useful in this respect and will be discussed in the next section, but the point itself needs little discussion. Our entire framework for recordkeeping informatics has been built upon the belief that it will provide a solid foundation for the development of methods and principles and, subsequently, the creation of teaching and training exercises and case studies that can transfer those methods and principles to others.

The last of Coiera's bullet points, the evaluation of the impact of interventions on the way individuals and organisations work or on the outcome of the work, is often neglected. It is human nature to look away from complexity or to put a favourable gloss on our activities. For decades archivists in Australia, for example, issued disposal schedules despite the only workplace evaluation of their reception in agencies of which we are aware (conducted by the Sydney branch of Australian Archives in the 1980s) showing that the schedules were being read in a very different fashion from their intended meanings. Sometimes you just become too attached to your way of doing things to evaluate it.

Similarly, in the era of paper-based records management and the early years of computer-assisted records management, the connections between document management, records management and administration were tight, in what we have been calling a Weberian relationship. Accordingly, for some records managers electronic document and records management systems (EDRMS) came to be regarded as the *only* future for records management. However, there have been significant issues encountered in implementing such systems using new information and communication technologies. These

issues have not been identified or discussed in this book, which constitutes a gap in our account of recordkeeping informatics that needs to be filled, but what are the alternative models, such as open source, collaborative and content management approaches to recordkeeping, in the consolidating vendor market? What are the short-term realities and longer-term options for EDRMS software, and how do we embed recordkeeping understandings into organisations if we are too closely identified with one form of records management rather than recordkeeping across all activities?

There is a plethora of measurement strategies and tools that have been developed for use in evaluation. These include DIRKS, JISC's impact calculator and records management maturity models, and ARMA International's Generally Accepted Recordkeeping Principles. We need to ensure that practitioners are aware of the multiplicity of tools available and not place undue reliance on a single approach.

In evaluating impacts and outcomes we should not forget to evaluate the recordkeeping informatics framework of this book. Most frameworks of its type have emerged out of professional practice and can become out-of-date very quickly, but we have been looking for a long-lasting framework that can creatively evolve. Have we found it? What impact will this approach have when applied in your time and space? Can it be improved and modified? Is it capable of ongoing fluidity, or will it in time become yet another dead hand from the past?

In evaluations we should always remember that the recordkeeping single mind needs evaluating, dragging us back to words and phrases like evidence, authoritative resource management, and using time to conquer time. It is not that other things do not matter, but in carrying out *our* evaluations we should always ask whether the interventions support the spacetime management of events, the opening up of our life-chances, the management of our mutual associations, the way we govern our activities, the adequacy of our evidence-based decisions, and/or the forensically based investigation of past actions. If an intervention does not support at least one of these measuring sticks it has not succeeded as a recordkeeping informatics intervention.

10.6 Projects, Application Managers, and the Need for an Evolutionary Service Orientation

There is a need for educational materials that emphasise the reflexive agility needed to carry out effective interventions in organisations, whether as a staff member or as a consultant. Such interventions should, for all activities

where adequate authoritative resource management is deemed necessary, help aid the evolution of:

- the construction of information objects that evidence actions in and through space and time;
- the maintenance of a suite of recordkeeping services operating within whatever information architectures are being pursued in a particular jurisdiction or organisation;
- the re-engineering of recordkeeping infrastructures so that they support in sustainable and scalable fashion a modular approach to the evidencing of activities within web-based transactional environments;
- the establishment of a ‘recordkeeping floor’ in large-scale systems or a self-authenticating archive in more agile digital recordkeeping environments.

These are reasonable goals, but just to list them is to point to limitations in the evolution of our emerging information and communication technologies. In a teaching and training context, the above bullet points read like a research agenda. A great deal of useful research into recordkeeping requirements has been done over the last twenty years, some of which has been transferred into records management standards, but the broader goals of a creative approach to a recordkeeping floor or self-authenticating archives at a workplace level still seems to be distant. In particular, as we saw in Chapter 7, metadata research and strategies give us cause for optimism, but are still largely ignored or misinterpreted within implementation activities. A significant gap is apparent between what we know could be done and what is actually happening in the workplaces and marketplaces.

How can that gap be bridged? Perhaps one factor looms larger than all others. Actor–Network theorists call it material semiotics; we have been calling it the inter-relationship between topologies and topographies, between logic over time and the particularities of place. Unless the way we signify things (the logic) gets translated into material features of the environment (the topography), academic recordkeeping discourse is an indoor sport. It can help us sharpen our skills and knowledge, but the recordkeeping game is played in many different weather conditions.

One material feature that can help in evolution is the emergence of a recordkeeping-based approach to projects that not only uses recordkeeping informatics but will also help its principles and understandings of

using time to conquer time to evolve. In this respect, however, recordkeeping informatics will have insufficient workplace strength to be acceptable to others as a form of intervention. On an optimistic note, however, this weakness can be reduced on a project-by-project basis if we operate across organisations in a professional manner. Complexity is one reason why project team methods have been evolving over the last twenty years, because no single mind can cope, and there should be no difficulty in many instances in convincing people that an ethical recordkeeping single mind might be useful for many projects.

Project approaches can involve large enterprise architectures or more agile web-based approaches built around applications. The ones that records managers and archivists have to get involved with depend upon their workplace topographies, but, from a teaching and training perspective, web-based agility clearly has a lot more long-term relevance going for it. That is probably a good omen because archivists and records managers have for the most part been such insignificant figures in the evolution of large systems architectures.

Sometimes the emphasis upon fixed objects has worked against them. For example, archival institutions in the 1990s in Australia produced simplistic strategies that reflected a drive for unalterable text typical of a custodial view of archives. Australian Archives, for example, produced a Want it, Print it, Keep it, File it (Wikipifi) approach, which valued the object ahead of the need in our recordkeeping systems to use time to conquer time. Similarly, a more sophisticated but equally fixity-based electronic version emerged from the Public Records Office of Victoria involving the use of Adobe PDF to provide stability of content and XML to surround the digital objects with metadata. PDF, it was imagined, would still be readable in a hundred years time, as would XML. Neither approach takes into account the recordkeeping floor, the formation of a self-authenticating archive, or the expansion in complexity of software or mark-up languages.

At the same time in Australia, others were focusing on postcustodial fluidity and some of their energy went into the successful development of records management standards. As we pointed out in Chapter 2, they had been influenced by David Bearman, an American systems analyst and archival theorist whose ideas on electronic recordkeeping were compatible with Australian continuum approaches. In Australian standards, a recordkeeping variation of structured analysis was produced for the design and implementation of recordkeeping systems (DIRKS) that drew on Bearman's work. Bearman and Richard Cox at the University of Pittsburgh had applied the

principles of structured system design to the formation of archives and gave us a conceptual glimpse of self-authenticating electronic archives that could emerge organically from links between our business processes and electronic recordkeeping.¹⁸

Many in the United States, however, argued that it could not be done. In a sense, both groups were right. The scale of organisation-wide structural analysis, while able to be modified in the ways envisaged by Bearman, was already beginning to become over-codified and cumbersome. When it was incorporated into DIRKS, it was done so via the waterfall method of system design, a linear approach that was over-engineered and inflexible when the world was moving towards more nimble forms of computing. In terms of content, DIRKS contained much good material which any teaching and training program for recordkeeping informatics should seek out, but, in terms of method, it did not transfer the understandings and principles of the standards into an evolutionary force.

This is discussed in more detail in Chapter 2, where it was also pointed out that the implementation model for DIRKS put too many eggs in the one basket and the basket carrier was not listening to recordkeeping advice anyway. As we have been arguing regularly, however, ignoring the record-keeping single mind can help generate chaos:

- at both the level of the whole (the big issues from climate change to the future of democratic government) and of the part (the administrative incompetence of many managers, for example, the loss of control at Arlington cemetery of who was buried where, which was apparently caused by the introduction of new systems!);
- in the way we access big data, the avalanche of recorded information that can be trapped and searched from many different directions, changing all our past arrangements for privacy, copyright and archival access;
- and across the plasticity and indifference of the archival multiverse, in which the ethics of recordkeeping fade into the background against our new and powerful means of information production.

In theory, the problem with large-scale system design methods, such as the Waterfall method, was that they run against Gabriel Tarde's basic

18 For a contemporary comparative account of the Pittsburgh Project, see Paul Marsden, 'When is the Future: Comparative Notes on Electronic Recordkeeping projects of the University of Pittsburgh and University of British Columbia', *Archivaria* 43 (1997): 158–173.

rule that the parts are always more complex than the whole. The DIRKS method incorporated into records management standards in Australia and internationally can help us manage the complexity of the monads, but not if it is distorted by a heavily-engineered top-down approach that traps expanding complexity under a blanket.

Again, in theory, a solution is at hand. Throughout this book we have been placing particular emphasis upon agile computing and the possible role of recordkeeping within it. We place a special emphasis upon the construction and management of self-authenticating archives as web-based repositories of recorded information about our actions. This will not simply be a cloud-computing pipe dream if we can successfully teach and train people that can work within and develop suitable structures, tactics and strategies for the construction of archives using application tools.

The technology for recordkeeping-based application platforms has been around for a few years now; long enough to have influenced our approach to applications in this book. The US consulting company Gartner in 2011 reviewed a number of such application management engines for cloud computing that from our viewpoint could have developed into better business tools if recordkeeping single minds had provided input into their development.¹⁹ The engines can knit together the singular diversity of organisational web ecologies, monitor the performance of applications from a central point, address problems as they arise, provide warning signals about unexpected or threatening events, audit and track actions, and increase our abilities to plan things in advance but to do so effectively for business purposes we would argue that they need to be modularised and tailorable within individual recordkeeping informatics suffused enterprise architectures.

This approach echoes the use of time to conquer time that has regularly been discussed in this book in indirect fashion. Only in this chapter has the discussion been explicit. The phrase, like the one that heads the Preface, comes from T.S.Eliot's classic continuum based poem, *Burnt Norton*:

But only in time can the moment in the rose-garden,
The moment in the harbour where the rain beat,
The moment in the draughty church at smokefall
Be remembered; involved with past and future.
Only through time time is conquered

19 See <https://www.gartner.com/doc/1613914/google-app-engine-windows-azure> (accessed 27 December 2016)

Without the existence of adequate recordkeeping informatics the space-time management capabilities of application engines will be more a matter of serendipity than engine-driven logic. Just where does reliable spacetime management come from if it is not from the application of recordkeeping skills and knowledge within our apps? Can you have such an engine that meets organisational purposes and makes cloud computing a lot safer without building into it recordkeeping perspectives derived from analyses of our organisational cultures, our business processes, and our access requirements? How can such engines maximise the use of metadata if the designers do not even have a reliable notion of just what is meant by recordkeeping metadata and have no strong continuum consciousness directed at using time to conquer time? If the recordkeeping informatics is poor (and it must often be poor given how little attention is paid to it), an application management engine can never achieve its potential. It can still work for applications that do not require authoritative resource management or where authoritative resource management is not complex, but will it be agile enough to provide adequate spacetime management support for our cascading transactions?

In Chapter 2, in discussing the issue of chaos, we pointed to Mandelbrot's fractal theory. Chaos might reign, but there will be patterns within it and order emerges when you start identifying the patterns. An application engine as a manager of a simpler whole that still provides coverage for expanding complexity will be more feasible if it can use fractals – those patterns that can provide tailorable and modular apps that users of the engines can plug in, play and replace without losing backward or forward compatibility of data.

Returning to the conversation in this chapter about the role of projects in teaching and training, we should be looking for and developing exercises and case studies that focus on a service orientation and emerging service-oriented architectures in an agile networked environment. The term service-oriented architecture refers to the framework in which service orientation is realised. To better enable integration and interoperability, system developers have been looking to modular or component-based architectures where complex systems are assembled from well-defined and standardised components. This vision is being further extended with the idea that these functional units could ultimately be dynamically assembled to carry out business processes. Information technology professionals at all levels dream of such integrated, agile and adaptable systems and use the term service

orientation to define and describe this approach.²⁰ It is seen as having the potential to deliver major productivity and capability improvements and, in so doing, transform the way business is done and the way that information technology is constructed, deployed and managed.²¹

Web applications in this approach could be fractalised. The parts might be more complex than the whole, but the patterns of the whole are recessively represented and we can build digital archives from our transactions in the manner of a mosaic, tailoring or rebuilding apps here and unplugging and reinserting modules there. We can incorporate the logic of the system at different levels of entry in to it. The apps can be used at different levels of operation as well as being further modified over time as they alter to fit new ways of doing things or new circumstances.

Service orientation can also be taught in ways that appreciate the richness of its history in archival theory, helping our thinking to escape from particular approaches in one time and place. As we argued in Chapters 2 and 6, the major records continuum models of last century were all service-oriented and pointed to the similarities in the services of archivists and records managers. These included:

- the United States' National Archives and Records Service model of the 1930s combining a vision of national government archives with the services needed to produce it;
- the extension of that approach in Australia by Ian Maclean and Peter Scott to focus on the complexity of recordkeeping practices and the use of fractals (in this case the records series) to manage that complexity;
- the Monash records continuum model built out of services for storing recorded information that helps time to conquer time by paying attention to the qualities of transactions, evidence, identity and recordkeeping containers.

The models were meant to help us focus in single-minded recordkeeping fashion on the design and implementation of recordkeeping systems that were in tune with recordkeeping logic for the adequate management of transactions and their carriage over into different times and spaces.

20 L. Cherbakov, G. Galambos, R. Harishankar, S. Kalyana and G. Rackham, 'Impact of Service Orientation at the Business Level', *IBM Systems Journal* 44.4 (2005): 653–690.

21 For further detail, see Barbara Reed, 'Service-oriented Architectures and Recordkeeping', *Records Management Journal* 18.1 (2008): 7–20.

So when we argued in our first article on recordkeeping informatics that service orientation architectures were good news for records managers we were remembering a past but applying it to a new future.²² Process analyses offer the potential for recordkeeping to be embedded within electronic business processes, including within the application engine techniques where presently they are clearly absent.²³ Recordkeeping processes, constructed as utility services, can be orchestrated into business workflows, capturing evidence of business transactions, as and when appropriate. The deployment of these recordkeeping services would then be governed by policies captured in recordkeeping business rule engines and supported by recordkeeping service and metadata registries. In addition, with service orientation aiding the decoupling of data from applications so that it is more accessible and able to be utilised where and when it is required, configuring recordkeeping processes around the automated capture and reuse of recordkeeping metadata becomes a much more viable proposition. We can incorporate recordkeeping in quite new and different ways into business processes and communicative practice that are consciously designed but still manage to provide flexible and responsive ways of delivering and using recordkeeping within our system components.

10.7 Conclusion

Building the discipline base for recordkeeping informatics has scarcely begun. It is a massive undertaking, requiring engagement and input from others, and cannot be considered the exclusive ground for a few people collaborating at a certain time, in a certain place. Those entering in on an ANT based approach to informatics need to review existing disciplinary infrastructure and apparatus (their professional associations, their competencies, their educational materials and foci) critically, rigorously and robustly, with a view to distinguishing those babies from the now very murky and tepid bathwater. Understanding the topology in relation to the topography of our professional concerns, and prioritising consideration of process rather than thing will assist in developing new roles and occupations. Establishing the value of these roles can only be advanced when informatics professionals

22 Oliver, Evans, Reed, and Upward, 'Achieving the Right Balance'.

23 Hans Hofman, 'Introductory – The Realm of Metadata', in Frank M. Bischoff, Hans Hofman and Seamus Ross (eds), *Metadata in Preservation, Selected papers from an ERPANET Seminar at the Archives School Marburg, 3–5 September 2003* (Marburg: Archivschule Marburg, 2004): 11–26, 15.

exist and are confident of the nature of their contribution and their capabilities, as well as secure in their understanding of their relationships with colleagues in cognate occupations and their social role.

Discussion in this chapter has brought together key themes from the book that need to be addressed in order to effect real change. The key to change lies with educators, those responsible for teaching and training the practitioners of today and tomorrow. This chapter should be read as a challenge. We hope that it stimulates the development of appropriate case studies and exercises that are essential for the disciplinary base of record-keeping informatics. We welcome the start of an ongoing conversation.

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Recordkeeping Informatics for a Networked Age

Frank Upward, Barbara Reed, Gillian Oliver and Joanne Evans

'Without the adequate presence of recordkeeping informatics that produce evidence of actions we will be left with information sludge and an environment of increasing chaos – an environment that places us all at risk of underhand practices, unwelcome social consequences, and at a professional loss as to how to operate within the reality of increasingly complex digital ecologies.'

THE FOCUS of this book becomes more relevant to governance every day as rational and scientific thought flounders under the weight of post-truth politics and a welter of 'alternative facts'. Traditional values of openness, transparency and accountability also face new challenges from technical change. Recordkeeping informatics supports archiving processes and few challenges are of greater significance for the survival of humanity than the adequate formation of archives that serve spacetime management, mutual associations and life chances: the major elements of authoritative information resource management as defined by the sociologist Anthony Giddens.

The authors of this book as practitioners and as academics have witnessed and analysed the way changing technologies and the expanding continuum of recorded information have contributed to the disruption of normality in governance. Over time they have developed ideas about the relationship between social functioning, informatics, and the ethics of recordkeeping practices. In this book they use their thinking about archival practices to present a new teamwork and Internet-based business application approach that can help a recordkeeping mind to develop and help usher in a new era of cyber-maturity.

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