Modelling the continuum as paradigm shift in recordkeeping and archiving processes, and beyond – a personal reflection

FRANK UPWARD

Abstract

This article outlines the development of a records continuum model initially developed as a teaching tool to communicate evidence-based approaches to archives and records management. The continuum is being used in Australia as a metaphor to assist in getting records management 'right' in recordkeeping environments built around electronic communications, and the model supports this endeavour. It extends the concept of the continuum beyond metaphor, representing the case for viewing it in its fuller spacetime meanings as a worldview. In this form, the continuum is potentially a technologically driven paradigm shift within all information management and systems practice. There is a new game developing and the concept of the continuum can help us re-organise our knowledge for that game. This article will discuss the diversity of records management theory and practice. It will look at the meanings of the continuum and my own model of it, including the differences between a worldview and a detailed view. An annexe provides three other models. A continuum 'patrol and control' strategy for analysis is outlined briefly, and represents a point at which my own approach to the continuum is taking off into more detailed practical considerations in records management education and training.

Introduction - Modelling and records management complexity

This article presents a personal exposition of a model I developed some five years ago, and an exploration of the paradigm shift it represents. Models are ways of seeing things. Their acceptance or otherwise in an area like records management depends upon how much contact they make with the practical consciousness of those who undertake tasks that are considered to be part of that activity. The model strikes a chord with some practitioners and educators. It has found its way into many different training programs and academic frameworks in Australia, North America, Britain and other parts of Europe. It has been used as both a basis for analysis and to communicate with all members of an organisation that create records.[1] For other practitioners and educators, however, its relevance is not immediately perceived. In face-to-face discussion with those who have been perplexed all I have ever been able to do is shrug my shoulders. It is a tool for perceiving complexity and is already a simplification that, in my experience, is understood or rejected intuitively. You cannot have an easy discussion across a paradigm shift.

For those with whom the model strikes a chord, its simple dimensional component makes the strongest contact. It provides a view of recordkeeping at the point of creation, within groups, at organisational levels, and at inter-organisational levels. This provides a layered

and interconnected model for the ongoing management of systems and the formulation of strategies and tactics. It enables the model to be used to get ones bearings in such tasks as determining social and legal requirements for recordkeeping, conducting a business process analysis, doing a functional analysis for a classification system or disposal, undertaking appraisal, and carrying out systems analysis including on overview of the structuring of data about records. It also points to the widely understood need to:

- develop interconnected methods for document creation,
- establish and maintain routines within which documents are captured as records,
- and control the distancing processes involved in organising documents and records as an archive and/or as the archives.

These understandings can be thrown into many different technical contexts. The model can be used to provide a structure for a fundamental analysis of the earliest of recordkeeping systems. It can be used to analyse electronic business including recordkeeping within and between an organization's 'back office' and the broader levels of organisational and enterprise control. Records managers are operating in a multi-dimensional environment in terms of document creation structures, workflow procedures, enterprise control and what the public or client actually sees either directly or through intermediary interpretations from other agencies. These dimensions have always existed, but the need to concentrate on architecture in modern organizations has made them particularly apparent and led to the development of a new vocabulary for expressing them.

The layering approach provides a base for a multi-dimensional 'patrol and control' approach to archives and records management.[2] For most records managers, however, circumstance is the essence of practice. No records manager can afford to be so fascinated by the complexity of the layering processes that they are unable to act in the present moment. On the other hand it is also necessary to remain in contact, during present actions, with the potential of our technologies. An understanding of the architectural complexity usually has to be drawn down and acted on quickly.

Management of circumstance in records management increasingly means being able to draw upon the ideas from a number of information management and systems areas of activity. The purpose of the records continuum model is to help initial task analyses involving evidential requirements for recordkeeping. My own modelling work, and of colleagues at Monash, has been extending the tool into other areas. An annexe to this article provides a model for information management, developed by Barbara Reed, Don Schauder and myself. It includes two additional models of my own for viewing the information systems and 'publishing' aspects of records management.

Even an array of continuum based information management and systems models leaves out many components that need to be taken into account in a particular context. These can include information technology management, business process engineering, functional analysis, facilities management, cultural heritage management, project management, quality control, auditing, benchmarking, staffing, resource case presentation, and financial management over-all. I will not be discussing any of these in

this article, but they are all significant components of records management task complexity, as they are of all information management activities.

The spacetime continuum as a new game.

In handling this complexity it is not surprising that practitioners seek ways of simplification. This, in worst-case scenarios, can involve an obsession with one aspect of practice or another, but more usually involves seeking a comforting worldview that can guide work and help in communicating with others. For much of the last half of the twentieth century in information management and systems activities, life cycle models have provided the dominant model and records management is no exception. During the 1990s the worldview of some Australian practitioners has begun to be influenced by the concept of the continuum. The records continuum model in this article represents the first attempt to model it, outside of models relating to the National Archives of Australia's system of control for documentation.[3]

It is difficult, these days, to use the term worldview without mentioning Thomas Kuhn's conceptualisation of a paradigm shift.[4] It is not the intention of this article to explore the strengths and weaknesses of that concept. I will accept it and get on with arguing that the continuum is a fully-fledged paradigm shift in which a worldview is being replaced. The term paradigm shift is often misused in popular writings to cover the replacement of any significant detailed view of things, but the shift to a continuum view is the genuine article operating at overview levels. This was the case in the physical sciences. In 1908 the Lithuanian mathematician Hermann Minkowski completed a settled view of the continuum in which the three spatial dimensions are inseparable from time. He did so with a prophetic flourish:

> Henceforth, space by itself, and time by itself, are doomed to fade away
> into mere shadows, and only a kind of union between the two will
> preserve an independent reality.

His continuum was carried forward into Einstein's theories of relativity and is frequently cited as the crucial insight that was needed for the overthrow of the 'Newtonian universe'. Most of us at least have a vague recognition of the significance of Einstein-Minkowski spacetime in which the speed of light is the same for all inertial observers regardless of the motion of the source.[5]

Einstein's iconographic status meant it was always likely that Einstein-Minkowski spacetime would assist in popularising the word continuum within the narratives of different professional groups where mathematical modelling and theories of relativity may not seem to be relevant. A health care continuum is one of many examples. A range of service providers and strategies have to be brought together and integrated across and through the 'shadows' of space and time so that the best mix can be achieved in a present context and adjusted as the shadows alter. Development requires constant adjustments to the relationships between different services as needs and services change. The problems are complex, there is constant stress across the whole that needs to be spread, and there are no single solutions to the managerial problems. The continuum, however, provides a singular view of that complexity.[6]

As an archivist/records manager I was imbued with the continuum view of the life history of records developed by the Australian national archival authority between about 1958 and 1966. I do not consider that approach to be a paradigm shift. It is part of the ongoing twentieth century search for continuity between archives and records management represented also in the use of the life cycle metaphor in European and Anglo-American archival theory. It was a new move within an old game, not a new game.[7] Within that move the national archivist, Ian Maclean, in essence declared that records managers were the true archivists, and that archival science should be directed towards the study of the characteristics of recorded information, recordkeeping systems and classification processes.[8] It was not until the Canadian archivist Jay Atherton presented his move in the mid 1980s that the word continuum began to be widely used as a way of describing the Maclean approach in Australia. Atherton showed how the life cycle stages that records supposedly underwent were in fact a series of recurring and reverberating activities within both archives and records management.[9]

As a result of my interest in the concept of the postcustodial archives I began to ponder whether the continuum might be more than a new move in an established game. What will recordkeeping and archiving processes be like when the location of the material matters less than its accessibility, when records no longer have to move across clear boundaries in space or time to be seen as part of an archives, and when an understanding that records exist in spacetime, not space and time, is more intuitively grasped by any practitioner? Such a scenario calls for the invention of new rules within a new game, and will result in a significant re-patterning of knowledge.[10]

As I have indicated above practical consciousness is not a single thing, but in relation to theory it does provide a single rallying call – *what about practice*? This is a call that anyone discomforted by a spacetime view of reality can always utter. Reality is messy and complex and an understanding of it is not easily practiced. I would argue that a good understanding is never too advanced for implementation. A practitioner who can understand complexities of spacetime will have no trouble understanding the many simpler operational contexts in which we pretend that space and time are separate. Newton's model of the universe is of practical value in many situations, but no mathematician using it is any longer unaware of its spacetime defect.

In records management, the continuum certainly provides a better view of reality than an approach that separates space and time. In twelve years of practice as an archivist and as a records manager I saw the records in hundreds of agencies. In retrospect I cannot remember seeing anything not describable in continuum-based language. I saw extant records that had been shaped by management processes in which the creation, maintenance and disposition stages had blurred and swapped places with each other in accordance with the contingencies of the situation. Note that I include creation, which far from being a starting point is a continuing process. The continuum does not reject cyclical views of reality. As my colleague Sue McKemmish has argued, records are in a constant state of becoming.[11] They are stretched into new shapes and structures during the filing and aggregating processes that form them, and by disposal and new

administrative patterns, which alter their physicality and the control and attention that they receive. Even disposition is cyclical and never final. Records no longer extant or moved elsewhere can still be observed in the place they once occupied in spacetime through data about their life history or their connection with events. Even if they cannot be observed, their place in spacetime is always there. Records can even have multiple lives in spacetime as the contexts that surround their use and control alter and open up new threads of action, involving re-shaping and renewing the cycles of creation and disposition. These are all fairly obvious perceptions. Less obvious, but of the same character, was the way every record in the archives was being constantly remade as it moved in and out of use in the search room, as the controlling and enabling structures for that use altered, and as its physical composition deteriorated, sometimes so noticeably that special preservation action was required. Records can never be set aside from spacetime.[12]

Is a spacetime approach really a new worldview for archivists and records managers? Were our forebears blind to the unity of space and time? After all, explorations of this unity have a lineage traceable back to Aristotle within European classical metaphysics, and go back still further when one looks at aboriginal beliefs and customs. It is a perspective present in much twentieth century literature, including existentialism, post-modern ways of setting the past and present at work within novels, and within science fiction. Modern archivists and records managers certainly are familiar with what is described but have observed that reality within patterns for knowledge, and structures for managing records, that have depended much upon the separation of space and time. That has always seemed to be the manageable way of tackling records management, but continuum theory is beginning to put forward alternative means that better match the reality.

In illustrating the proposition that the continuum is an emerging overview in archives and records management, I want to briefly point to the two strongest categories of negative reaction to the continuum that I have encountered. One strand of reaction comes from archivists who see themselves as part of a cultural heritage business. The other comes from records managers who see themselves as servants of the current needs of their organisation. In the first view the continuum can be seen as too records management orientated; in the latter it can be viewed as too heavily archival. These thoughts are the product of the practical consciousness of people still playing the Newtonian game. They are arguing that archivists and records managers have their own spaces and times to play in, and please don't blur the boundaries[13]. The reactions of those archivists, records managers and students I have met who are beginning to play the new spacetime game are different. They are keen to assist in the process of reorganising their own knowledge, and past knowledge, and to contribute to the development of new rules for the new game, one in which the boundaries are blurred. They understand that they can do this without losing contact with existing specialisations. Within a spacetime worldview no space and no time is privileged, or completely finalised. Minkowski's 'kind of union' between space and time is relevant to the nature of the task at hand, be it a current, historical, or regulatory one. The task can still orientate our specialisations, and that is where detailed knowledge is called upon. It is the worldview, not the detailed application that can unite us.

Modelling the continuum

Many models are ephemeral. They depend on the elements drawn upon at the time they are constructed. If one is modelling complexity, not complication, you need something that is applicable in different spacetimes. The complex issue faced by an engineer building a span bridge is that if the tension in the structure is not spread then the bridge could fall down. This is not necessarily affected by the method chosen for the complicated process of putting girders into place, which an engineer also models in different ways for each job. For the persistent model the engineer uses continuum theory, dealing with the spread of stress across points in the structure. Everyone using the bridge depends on the fact that the model is not ephemeral.

My own continuum modelling is meant to work at this persisting conceptual level, modelling complexity not complication. It contains my own practical consciousness. I had worked within the Commonwealth Archives Office continuum approach mentioned above. When electronic recordkeeping issues resurrected continuum approaches in Australia, it re-awakened my interest in the continuum as a concept for handling complexity, an interest shared with my colleague Sue McKemmish. In our teaching Sue and I, working from inspiration provided by David Bearman, began to present models for the networked age as rules for a new game.[14] My inspiration for a spacetime model of the records continuum was the writings of Anthony Giddens' on time-space distanciation. Giddens' theory matches a pattern observable in all information management activities and much organisational theory. He outlines four inter-acting layers of distancing, the first closest to an action, and the fourth in the further reaches of spacetime. His four regions are:
- intersections of regions and a spatial spread away from the immediate contexts of interaction,
- routinisation which provides a temporal spread away from immediate contexts of interaction,
- time-space distanciation, and
- forms of the societal totality.[15]

To my mind this is clear enough, but I have a background of study in social history. To most practitioners it will mean little. In trying to reconceptualise Giddens' theory in a way which would communicate better to archivists and records managers, I started to compare Giddens' ideas with the processes of creation, capture, organisation and pluralisation.
- Create equates with a point where individuals as creative sources engage in particular activities. Recorded information spreads away from their acts. Creation is an intersecting dimension.
- Capture equates with a point at which communications are brought into a framework that enables consistent and coherent use of information by groups of people. This involves the addition of information about the recorded information and its communication, metadata, which disembeds information from the immediate contexts of its creation. Capture is a dimension of routinisation.

- Organise equates with the need to marshal information across a range of participants who do not share the same frameworks of the group interaction. Commonly navigable structures and understandings have to be set up within systems so that the information can be shared in different spacetime. This is a process which could be described as the organisation of memory. It is the prime locus of time-space distanciation.
- Pluralise equates with taking information out to points beyond organisational contexts into forms of societal totalities, still more distant from the organisations, community totalities, and whole of person views of the individual, within which the creation and capture processes took place. This is a nebulous region in the broader reaches of spacetime, involving memory as it is formed across societal totalities. It involves the use of information in ways which are less predictable or controllable

There are hidden complexities in this simple spacetime dimensionality for recorded information, not the least of which is the need to read the model in a scalable manner without making precise boundary determinations. Is an organisation, for example, part of the organise dimension or the pluralise dimension? It is portrayed in my modelling as an aggregation of groups, but it is also a widespread form of societal totality. Where do the boundaries of an organisation begin and end? There are always likely to be organisations within organisations, although in some cases the organisation can exactly coincide with the workgroup. Where do you put a government? I put it in the plural dimension unless I am considering it in relation to something like a parliament when it becomes part of the organising dimension. What about the complexities in relation to organisation and pluralisation caused by privatisation, extranets, out-sourcing, and other multiple company arrangements? No worldview can resolve these complexities, but the continuum provides best practice in identifying, describing, and analysing them. It provides a different overview to the problem within which our detailed knowledge can be re-arranged.

The Giddens' theory ultimately found expression in a model for the information continuum, drawn up by Barbara Reed, Don Schauder and myself [see the annexe to this article]. Before then it found expression, in my modified form, within the records continuum model, providing a backdrop for the establishment of a master sets of points for continua of direct relevance to the evidence component of records management. [See *figure 1*]

In establishing the points to impose on the distanciation model, I drew on my own experiences and the emerging global interest in 'recordness' and archival theories about provenance and ways of describing it in relation to business activity as well as the more traditional descriptions of creating agencies.[16] These interests raise basic questions of evidence about who did what. These questions, in turn, are central to the role of records in providing forms of information used for accountability purposes, another issue we had been exploring at Monash.[17] The four continua I chose to represent as sets within a spacetime continuum model were identity, transactionality, evidentiality, and recordkeeping containers [which I more normally refer to these days as recordkeeping objects]:

- **Transactionality** - relates to records as products of activities.
- **Identity** - relates to the authorities by which records are made and kept, including their authorship, establishing particularities of the actors involved in the acts of records creation, the empowerment of the actors and their identity viewed from broader social and cultural perspectives.
- **Evidentiality -** relates to the records as evidence, [in an early draft, this was titled integrity and continuity].
- **Recordkeeping Containers** - relates to the objects we create in order to store records.

The method of graphic representation I settled on for publication clearly represents time-space distanciation as a backdrop to the four continua.
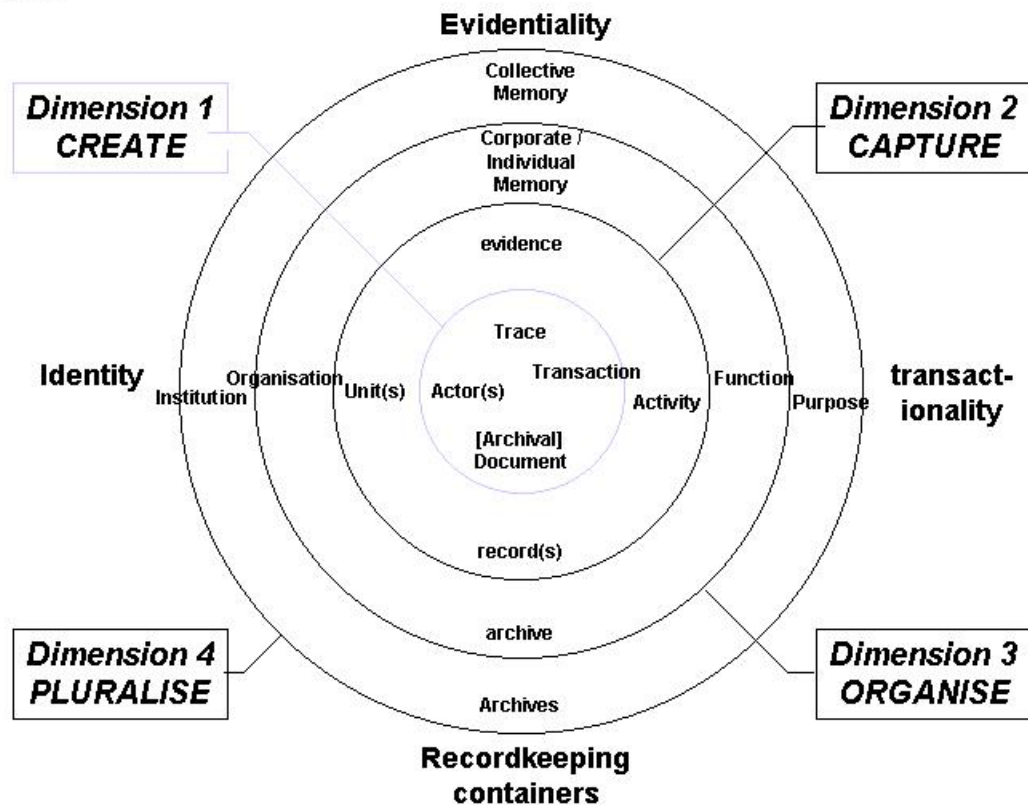
Figure 1

FIGURE ONE. THE RECORDS CONTINUUM MODEL

The circles can be read as representing a rippling outwards or a pressuring inwards. The continua can be read as in constant motion around the intersecting point of creation. Indeed I initially called them axes, and drew them as lines on the diagram. There are variations to the way I, and others, have presented the model, but the representation in this article is true to the original version and retains its terms.

In selecting terms I tried to choose ones that have a reliable dimensional locus and general significance to practice in archives and records management, but there are many unexpressed points of practical significance. Words like file and series are examples. Locating them on the continuum, however, is not something that can be done with any certainty. Files and series exist somewhere in the recordkeeping containers continuum, usually between the record and the archive. Some files, however, barely function as records if they manage to do so at all, especially digital ones. Digital files are more directly connected to data, the unexpressed bits at the core of the model within the atomic structure of the recordkeeping containers. Digital files occur at a point between the data and the record and pay only passing homage to the document through printouts, screen images, and other communications, although that fluid homage can also be captured in fixed form if we wish. As for series, you can have a series of any recordkeeping object.

The terms are self-defining and not shaped by the need to communicate to an audience of any kind, other than those who appreciate the persistence of the terms in spacetime. This is a model for a new game, a structure for the re-organisation of past knowledge. The terms are 'defined' by where they appear in the model, and the relationships they have with other points. A word like archive, in the model, can be described as all the recallable records of an organisation or individual connected to its business functioning, as the model shows in its 'third' dimension. It can be described more fully when one starts to tease out the relationship with the other dimensions and points. As the Australasian archivist Chris Hurley noted in a seminar where the model was first presented in its final form, this is Upward playing God. He was not being unkind or sarcastic, or at least I don't think so. To model persistence one has to create a meta-model of the continuum within which us mortals, including Upward, play our language games and can be pinned down into the regions of interest that dominate our perceptions. The person who frames the model, however, controls the pinning down process.

Naming of the parts is an onerous task in modelling complexity, and defining them always raises the issue of professional and cultural perceptions.[18] The moment professional or cultural factors intrude, persistence is lost. Apart from the word 'Archive' which can produce an allergic reaction in some records managers who cannot contemplate that the archive is anything other than the 'old stuff', there is a general dislike of the use of [archival] as a preface to the word document. The term and the square bracket simply indicated the potential for the document to be part of the continuum, again clearly shown in the model. The fact that 'archival' is a poor communicative word when addressing some records managers is a cultural problem. It is irrelevant to the model, as distinct from its communication. Similarly, one can debate the word document at length as a communication tool. Individuals have very different perceptions about the nature of documents. From a teaching point of view, and within practical analysis, it is the relational and self-defining nature of the model that makes it useful in opening up such debates, not closing them off before they begin. You do not create a persistent model by basing it on current communication needs or tailoring it to dominant professional perspectives. Once this is understood then professional meanings can be analysed. If professional meanings are brought to bear from the outset a model that was meant to transcend and clarify terminological disputes gets tangled up in them

Australian Practice and the Continuum

The replacement of one paradigm by another can occur quickly. Working through the implications of the shift's effect on the way knowledge is organised always takes time. In Australia the spacetime view of the continuum is still in its formative stages as an influence upon our communities of practice.[19] We do, however, have a long history of attempting to practice the continuum's meaning as a metaphor for continuity between archives and records management, the old game. As I indicated above, the continuity game is an old one clearly observable in European and American theory, including within life cycle models, and existed well before the Australians started playing it[20].

Eric Ketelaar has argued the danger of professional groups giving meanings to borrowed metaphors.[21] The advocates of both life cycle approaches and the continuum have been pursuing continuity of processes. Some of the differences between the approaches are imaginary, and both groups can draw upon a similar pool of knowledge without any need to re-organise that knowledge. In all countries we could ignore metaphor and speak directly about system design, recordkeeping and archiving processes, collaborative action, the development of continuous approaches from the point of creation, and so on. In fact, in Australia, like anywhere else, we do this.

Apart from a system of control for archives our search for the continuum has produced little that marks Australian practice out from practice in any other country. We do have a numerically strong records management profession, but that profession has typically given allegiance to a records management version of the life cycle approach, in the same way that it has done in other countries where the profession is strongest. More recently, however, the continuum is becoming a rallying point for practitioners who are more in tune with the new game. This goes beyond metaphor into the deeper spacetime meanings, even if it is seldom expressed or understood consciously. There is an approach developing in which we are looking to spread the stress. On web sites and the Australian Society of Archivists listserv, you will find evidence of a growing rapport between records managers and archivists at professional society level and developments in the way federal and state archival authorities are advising their recordkeeping constituencies. Other on the ground developments include a competencies standard for records and archives work [undergoing revision at the time this article was prepared] and further work on the development of standards now that the Australian Standard on Records Management, AS 4309, is in the process of being superseded by the International Standard it helped to bring about.[22]

We have some distance to go. One of the central methodologies in the above strategies, the 'DIRKS' method for the design and implementation of recordkeeping systems, is expressed in a linear, stage-based model imported from an old paradigm of information systems analysis. I for one question whether this approach is out-of-date, although the model, when developed, was drawing upon the sort of understandings still prevalent in many information systems analysis textbooks. There is no doubt from my side of the spacetime shift, that many texts, in the futile attempt to teach a life cycle based approach

to systems design create conceptualisations of the life history of systems which are unreal at an application level, and get confused with structures for project management techniques in which phases of application need to be established. The life history of systems design and operation always has to engineered in the context of particular applications. This problem is starting to show through in the obvious disparity between traditional life cycle methods of representing information systems approaches and the newer continuum-connected approaches to system design including rapid application development in an object oriented environment, continuous development methodologies, and prototyping. The DIRKS method may contain system design unrealities, but the content is very useful, the methodology is under trial and should not be read as existing in its final form, and there is an introductory recognition that the context of the task over-rides the stages.

In Australia, the continuum view has not yet been widely extended into current and historical recordkeeping tasks following the lead of the regulatory moves outlined above. If that occurs in conjunction with the continuing development of the 'DIRKS' method, Australian practice should continue to be worth watching.

Conclusion

As Ketelaar noted in the previously referenced article, and as I have indicated throughout this article, practice is cultural. We fit our detailed knowledge into ways that are agreeable to our communities of practice. There is certainly a cultural component to Australian use of the word continuum. It is a rallying point, one that helps like-minded people to identify with each other, and marks out a particular type of practice.

As paradigm shift, however, the continuum is more than cultural. It provides a worldview that can help harness the development of knowledge in archives and records management globally. This is not to disrespect the importance of the past contributions. We can maintain the community of practice knowledge of those in the shadows of the past who have made detailed contributions to the profession, even though their worldview belongs to them, not us.

A worldview has its limitations. Just as the life cycle has passed its 'use by' date so too can the continuum. Because a worldview is a simplification, it is also vulnerable to detailed scrutiny. As H.L. Mencken said in his often quoted dictum, there is a simple answer to every complex problem and it is always wrong. Minkowski's spacetime is not an elaborate construct and to have any practical impact it needed the context of the detailed views of relativity possessed by Einstein. In records management the necessary detailed knowledge is only in the process of being re-organised within the new game.

When I presented the continuum in *Archives and Manuscripts* I put it in the context of the detailed views of relativity provided by postmodernity and structuration theory, or at least the varieties of these provided by the writings of Jean Francois Lyotard and Anthony Giddens.[23] It was too early to put it in the context of practice. It would have been more dramatic to present the model within a focus on the paradigm shift it

represented, but at the time I was not a truster of any paradigm. I am now a full convert to the continuum as paradigm shift, rather than a slightly cynical promoter of it. It can never provide complete or satisfying views of detailed practice, but that is not what a worldview does. It provides an overview for re-organising our detailed knowledge and applying our skills in contexts framed by the task at hand.

The continuum provides a way of explaining complex realities in relation to what used to be regarded as the separate dimensions of space and time. As a view it presents a multi-layered and multi-faceted approach which can be used to re-organise knowledge and deploy skills. It is more in tune with electronic communications and technological change than a life cycle view. It can enable us to consider how to spread the tension across structures to prevent them from collapsing.

Like Minkowski's continuum, the records continuum needs to be absorbed into the new game it promises. In records management, that game has been represented in the introduction to this article as one that involves
- multi-dimensional patrol, and control of its plumbing,
- a recordkeeping architecture which is not divorced from the other information management and systems knowledge and skills,
- and an ability to bring to bear particular forms of management, in the general sense of the word, as necessary.

This is the strategic and tactical approach I am currently developing as a conceptual model for education and training, my own area of practice. I hope I have given enough of an insight into the continuum as worldview to give records management practitioners a better understanding of how to make moves within the new game. The more people playing the game the better it will become.

Annexe
Other information Management and Systems models

Records management knowledge and skills are not restricted to the recordkeeping and archiving processes represented by the records continuum model. Once the records continuum model was developed, however, I wanted to stop. A colleague, Barbara Reed, was struck by the absences and kept going. As a result, Barbara, Professor Don Schauder, and I developed an information continuum model [*figure 2.1*]. In the process we established that the model was replicable. The backdrop of time-space distanciation provides consistency through the two models in the way they map relationships. The foreground provides a method for stretching out the continua chosen to represent particular specialisations.

This structure can be described as the model's general metaphysics. The foreground undertakes a task in philosophy traceable back to Aristotle's concern with being *qua* being [a thing observed through its essentials]. It is a concern with what the philosopher Michael Loux describes as 'the attempt to identify the most general categories under which things fall and to delineate the relations that hold among these categories'.[24] The

background raises philosophical issues about spacetime and has a settled view on these, a concern that can also be traced back to Aristotle in the history of documented human thought.[25]

The records continuum model deals with recordkeeping as recordkeeping. The other models described in this annexe deal with information management as information management, information systems management as information systems management, and publishing as publishing. I have not explained the models or terms used, except for basic annotation. Explanations can be found on a web site I am constructing.[26] They have been included in skeleton form here to illustrate the metaphysics of the model.
The presentation, below, starts with the information management model, looks at information systems, and ends with a publishing continuum.

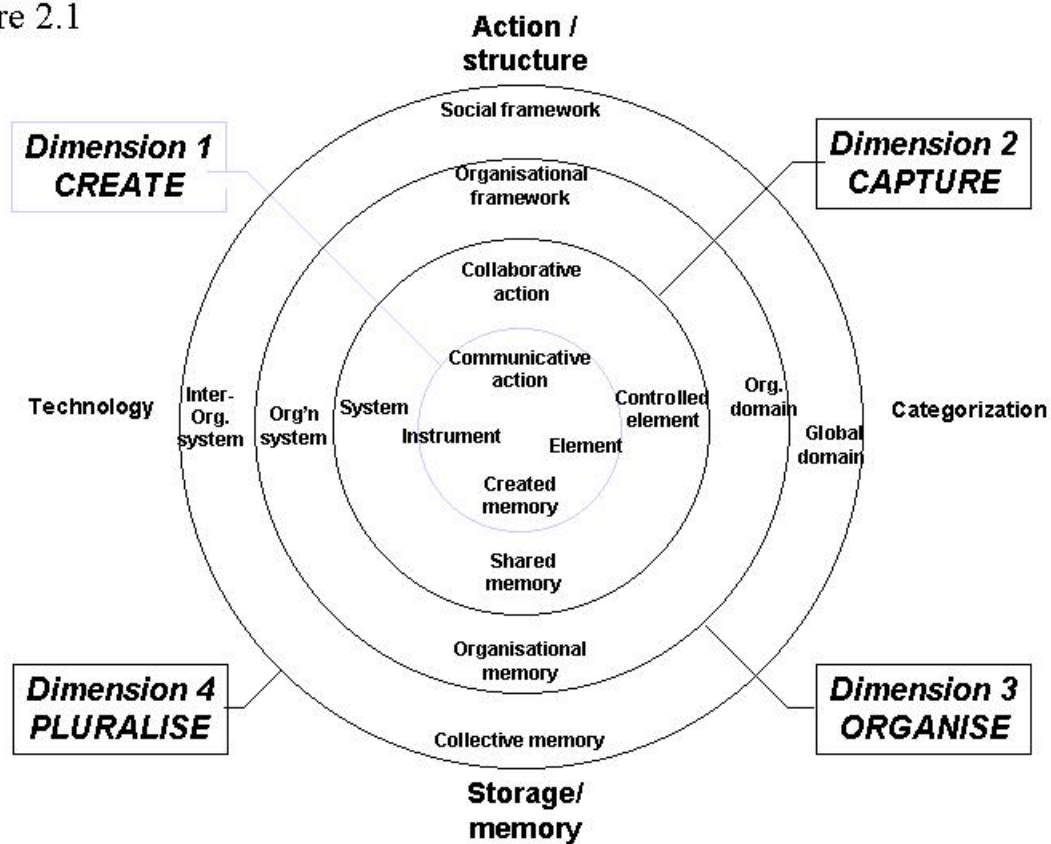**The information continuum model**

Figure 2.1

FIGURE 2.1 THE INFORMATION CONTINUUM MODEL

Notes: Records need to be managed in an information management sense, where the emphasis is on the way the object is represented, recalled and disseminated. This model provides an overview of information management which can guide perceptions about the information management components of records management.

- *Categorisation* refers to classification, and levels of classing.
- *Action/structure* indicates this is a sociological model. The structures we act in influence what we do, and what we do influence the structures.
- *Technology* is identified with the tools we use to manage records in the different layers.
- *Storage/memory* is just that, although it should be noted that whereas the records continuum model deals with memory in recordkeeping objects, this continuum relates to the human mind.

This is a sociological model. Sociology has already moved into the spacetime paradigm. Giddens' theory of time-space distanciation is an example at conceptual levels, while health care continuum models illustrate this at a practical level. Within sociology 'lifespan' is supplanting the phrase life cycle, pointing to the word continuum advocates need to use when discussing the life history of records.

The information systems continuum

Figure 2.2

Power Modalities

Normalisation
Interpretation
Facilitation
Enunciation

Dimension 1 CREATE
Dimension 2 CAPTURE
Dimension 4 PLURALISE
Dimension 3 ORGANISE

data modelling
Data Plumbing

Inter-Org. requirements
Group requirements
Inter-org Cnnectivity
Org'n requirements
Data representation
Source
Linkages
Org. Connectivity
Medium
Dara structures
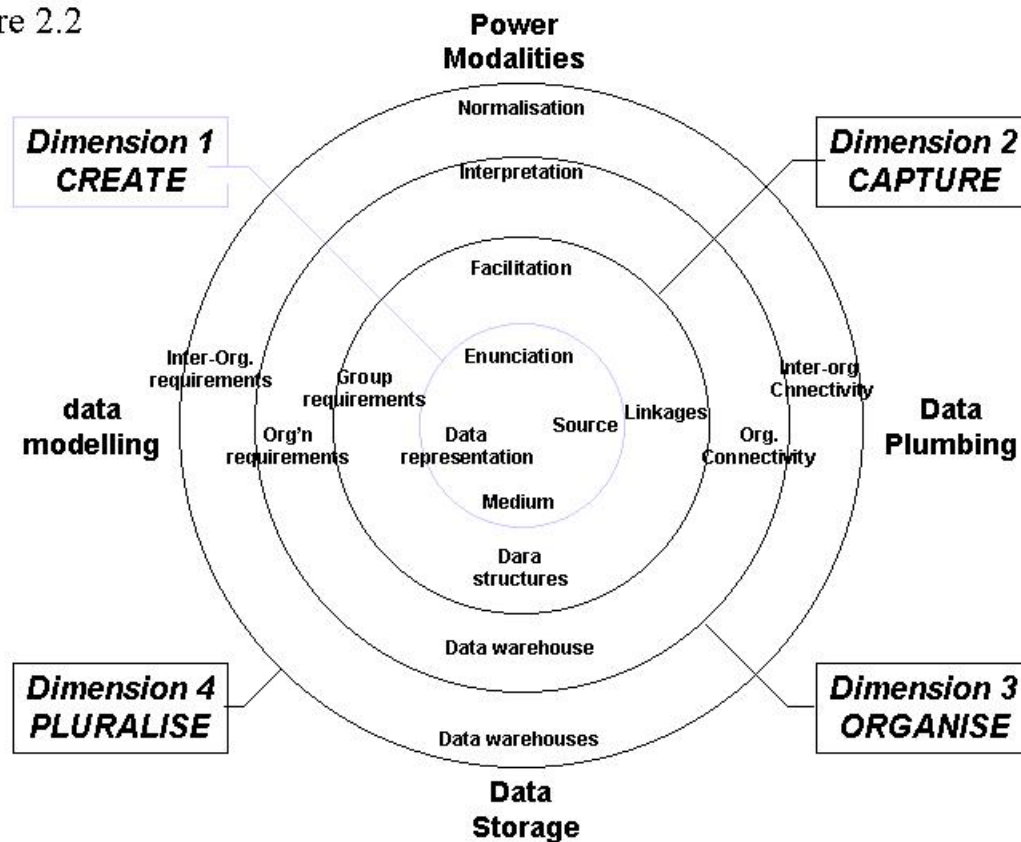Data warehouse
Data warehouses

Data Storage

FIGURE 2.2. THE INFORMATION SYSTEMS CONTINUUM MODEL

Notes: Records need to be managed in a data management sense, with an emphasis upon data modelling [date entities, their attributes and relationships] and the connected flow of

objects. *Figure 2.2* provides an overview of information systems as power. Recordkeeping systems are a type of information system where the system as an instrument of power is particularly apparent.

- *Power modalities* draw upon the writings of Anthony Giddens[27] and Michael Foucault[28], two leading theorists of the relationship between power and information. As with any of the terms in any of the models, the allocation of a term to a dimension in the model does not mean that it belongs nowhere else, only that this is a suitable locus. Enunciation points to who is speaking – the credibility and authority of the source. Facilitation is associated with the dimension in which systems routines are established. This is where interpretative schemes start to become essential as boundaries are crossed between communities of different practice as spacetime distanciation increases beyond those directly involved in shared tasks and activities. Normalisation refers to the effect of socially established conventions. In records management this includes standards issued by national or international bodies including records management societies
- *Data storage* is a tricky area. It is only beginning to settle down into methodologies at organisational and enterprise level, and most terminology is dominated by the second dimension capture routines set up within traditional database computing. I have used terms that are loosely descriptive but it is not feasible at present to select terms that can be assumed to have persistence.
- *Data modelling* refers to the emphasis on entities, their attributes and relationships, which can be found in any analysis of concrete particulars, including data, from Aristotle onwards [my continuum models are an example of data modelling at the meta level of Aristotelian philosophy],
- *Data plumbing* refers to the flow of data within interconnected architecture.[29]

This is a model for the professional activity of information systems analysts, depicting the intellectually 'different' focus that area has from any form of systems thinking and from other information management activities. Continuum approaches to system design and development are beginning to emerge, as indicated above when discussing the methodological flaw in the Australian 'DIRKS' approach. These were noted as including rapid application development, continuous development, and prototyping. Records managers should not trust outdated life cycle based approaches to systems analysis. More than any other information management and systems specialisation, information systems analysis developed out of intellectual trends of the last half of the twentieth century when life cycle models were ubiquitous. Unfortunately introductory textbooks are still riddled with such models. In my view, expressed earlier, it is possible that this arises out of a mistaken association between meta-theory about the life history of something with the operational phases that have to be established to make particular tasks manageable.

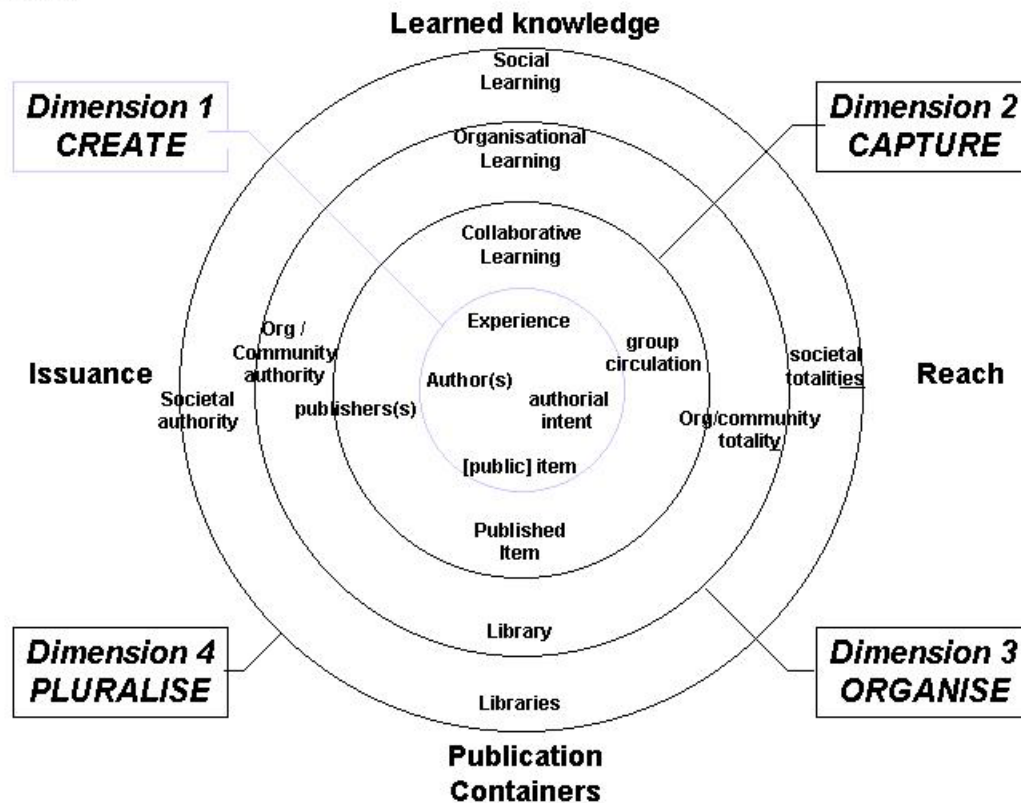**The publishing continuum**

Figure 2.3

Learned knowledge

Social
Learning

Organisational
Learning

Collaborative
Learning

Experience

group
circulation

societal
totalities

Reach

Author(s)

authorial
intent

Org/community
totality

Org /
Community
authority

Societal
authority

publishers(s)

[public] item

Published
Item

Library

Libraries

**Dimension 1
CREATE**

**Dimension 2
CAPTURE**

Issuance

**Dimension 4
PLURALISE**

**Dimension 3
ORGANISE**

**Publication
Containers**

FIGURE 2.3. THE PUBLISHING CONTINUUM MODEL

Notes: Records need to be managed in a publishing sense where the emphasis is upon the reach and authority of the object. This model provides an overview of the processes involved in making something public, or protecting them from unauthorised access. There is an obvious connection between these processes and access to records. One of the roles of records management is to get the 'reach' of records right, pushing them out into appropriate kinds of union between space and time, or allowing them to be pulled only from appropriate regions.

- *Learned knowledge* is an awkward term stemming from my over ambitious approach to include a knowledge continuum somewhere, and Don Schauder's suggestion to make this a learning continuum.
- *Publication Containers* refers to the genre, form or type of publication vehicle used. A cross referral to figure 2.2 indicates that a form of publication, as an information system, can be in any medium.
- *Issuance* refers to the enunciative modality of a publication shaped by the authorship, the publication process, and the authority under which the publication was disseminated.
- *Reach* is the actual spread of a publication.[30]

This model represents the differentiation of librarians, although as with the other models the emphasis is most definitely on differentiation, not separation. In librarianship literature, outside of a way of categorising particular types of publication, spacetime paradigms do not have to penetrate far in terms of conscious expression. A strong and professional client focus and a consequent dependence on technical factors in delivery is a survival factor forcing librarians into the continuum-based social and technical flows of the spacetime in which they operate.

Conclusion

The four models presented in this article represent the intra-disciplinary information management and systems nature of records management, as it does for each of the specialisations depicted. Through them contact is made with the recordkeeping tradition often associated with archivists in business or government, with everybody who creates and uses recorded information, with information systems analysts, and with the traditions of the librarian. The models can, of course, be read as representing threats to records management. Some records managers read the records continuum model in that way, and for them the further models may just compound the threats. In the old space and time view, each model represents a ways records management can be made to disappear as a separate activity. You can give the task to everybody within controlled policy and procedures, or to the archivist, the librarian, or the information systems analyst. Indeed that is what knowingly occurs in a country such as France.

The same threat is an opportunity. The records manager who appreciates this without railing against invasion of their space by other specialisations will see the significance of the continuum approach outlined in this article. Records management's separate space might not exist, but there are other strategies that are better than being a determined inhabitant of space, defending your turf. It is spacetime that is the reality, and which needs to be occupied. In spacetime, records management has always shown a persistent connection with business processes and the need to keep records of the actions taken during these processes. I am, of course, using the word keep in a continuum sense to include on-going creation processes. The records management specialisation has its foundations in the current recordkeeping tasks that abound in today's environment and which involve a range of intra-disciplinary and managerial learning and skills.

Using a wide range of continuum models for detailed analysis of tasks is an over-demanding process outside of training and education programs teaching the models themselves. Apart from the specialisations depicted in the modelling, detailed analysis, as indicated in the introduction to this article, can include a vast array of management techniques. The models provide maps, which can be consulted briefly in relation to recordkeeping projects, and can be used to estimate the specialist resources that might need to be brought to bear. The models themselves can disappear into the intuition of records management practitioners, and into the strategies, tactics, and methodologies, they develop for tackling tasks.

Acknowledgements

References

Author

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[1] Using a WWW text search engine such as google with the entry 'records continuum model' in mid 2000 produced a good indication of the models spread in professional discussion and its use in communicating to others. A search via "Upward continuum model" produced a mix of entries relating to my model, and to the upward continuum, an unfortunate merging of my surname with a common continuum modelling method. For a British example, showing how the model is spreading as a general one rather than an attributed one, and using it to communicate generally to staff in an organisation see *The Newsletter*, Society of Archivists, January 2000, No. 127. The model in this instance is mine, not the slight variation prepared by David Bearman which I have seen described in British literature as the 'Bearman model' of the continuum. David Bearman's model, with correct attributions and acknowledgements in the source document, made a few extensions of the model in an information systems direction, a move that is handled in my own modelling by extending the methodology into that region.

[2] The term patrol and control came to me via an excellent article by Brown, J.S. and Duguid P., 'The social life of documents' from the following web reference, http://www.firstmonday.dk/issues/issue1/documents. They associate it with the way documents patrol and control boundaries between communities, also part of the approach outlined in this article, except that the continuum provides an instant way of recognising that the boundaries are cultural, not metaphysical, constructs.

[3] For an account of the Australian system of documentation see McKemmish, S., and Piggott, M. [eds], *The records continuum: Ian Maclean and Australian Archives first fifty years*, Ancora press in association with Australian Archives, Clayton 1994.

[4] Kuhn, Thomas S., *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago, 1962.

[5] Rob Salgado provides a tour of the meanings of spacetime, helpful in preparing this summary. See http://www.phy.syr.edu/courses/modules/LIGHTCONE/minkowski.html

[6] For an explanation of the health care continuum see Endritz, Mary E.S., 'Managing the health care continuum', *The Journal of Managed Care Pharmacy* Vol 3. No 5 Sep/Oct 1997 accessible at http://www.amcp.org/public/pubs/journal/vol3/num5/examining.html

[7] The references in this article to game playing in connection with the paradigm shift are derived from Jean Francois Lyotard, *The Postmodern Condition: A Report on Knowledge*, Manchester University Press, reprinted 1997, page 43, and consult the index re language games.

[8] Upward, F., 'In search of the continuum' in McKemmish, S., and Piggott, M. [eds], *The records continuum: Ian Maclean and Australian Archives first fifty years*, op.cit.

[9] Atherton, J. 'From life cycle to continuum, some thoughts on the records management-archives relationship', *Archivaria* 21, 1985/6, p. 43-51.

[10] Upward F. 'Structuring the Records Continuum - Part One: Postcustodial principles and properties' *Archives and Manuscripts* 24 (2) 1996, also available on the *records continuum research group web site*, www.sims.monash.edu.au/rcrg/publications/recordscontinuum/fupp1.html

[11] See McKemmish, S., 'Are Records Ever Actual' in McKemmish, S., and Piggott, M. [eds], *The records continuum: Ian Maclean and Australian Archives first fifty years* op.cit.

[12] For an account which illustrates the notion of setting aside records within a separation of space and time, see Duranti, L. 'Concepts and principles for the management of electronic records, or records management theory is archival diplomatics'. *Records Management Journal*, Vol.9 no.3, 1999, p.153-176. A comparison between Duranti's approach to electronic records and Australian approaches is interesting. Duranti is the main antagonist of continuum approaches in the literature, and continually throws detailed knowledge against the paradigm, a debating trick that is common enough during a paradigm shift and is described in Thomas Kuhn, *The Scientific Revolution*, op.cit.. The true debate is between the paradigms, not the detailed knowledge. That is the level at which strategies and tactics work themselves out, and where there is a vast gulf between some life cycle proponents such as Luciana Duranti and continuum advocates. There is much less disparity in the detailed understanding of electronic recordkeeping between Luciana Duranti and continuum advocates such as myself, Barbara Reed and Sue McKemmish, if one compares like with like [i.e. academic with academic when functioning in academic mode]. Duranti offers insights from diplomatics, a tradition relatively new to us, which we find attractive. We offer insights from Australian experience which is itself part of a pragmatic Dutch or British form of the Northern European registry tradition. [Bearman, D. Electronic *Evidence, Strategies in Managing Records in Contemporary Organisations*, Archives and Museum Informatics, 1994, Chapter nine] Both traditions have a lot to contribute to records management theory, as

does the Germanic tradition, but as the title of Duranti's article indicates, her worldview is not as eclectic as the view that a continuum approach imposes on its adherents. .

[13] As David Roberts once commented on the ASA listserve, 'the continuum concept seems to make perfect sense to people outside our profession. It seems only to be records managers and archivists who have trouble with it.' In my experience European and Australian archivists have less trouble, and the geographical centre of distorted views of the continuum is the U.S.A., amongst some, but by no means all, archivists and records managers. The lack of a twentieth century registry tradition, a dependence upon linear life cycle models, and an assumption in argument that space and time are separate, combine to make the continuum very counter-intuitive for some.

[14] The starting model can be found in Bearman, D., *Electronic Evidence: Strategies for Managing Records in Contemporary Organizations,* op.cit. p. 43.

[15]Giddens, A., *The constitution of society*, Polity Press in association with Blackwells, 1986, p.298

[16] See for example McDonald, J., 'Managing records in the modern office: taming the wild frontier, *Archivaria,* 39, 1995, and Bearman, D., *Electronic Evidence*, op.cit.

[17] See Sue McKemmish and Frank Upward [editors.] *Archival documents, providing accountability through recordkeeping*, Ancora Press, Monash, 1993

[18] The article of mine referenced in 10. above, provides a more detailed explanation of terms, and a fuller elaboration will be made available on the web site of the *records continuum research group*, op.cit.

[19] See the articles assembled on the *records continuum research group* site, op. cit.

[20] See for example the last half of Jenkinson, Hilary, A manual of archive administration, various printings which deals with the making of the archive.

[21] Ketelaar, F.C.J . 'A difference best postponed' p.121-131, in Horsman, P.J., Ketelaar F.C.J. and Thomassen, T.H.P.M., *Naar een nieuw paradigma in de archivistiek*, Stichting Archief publicaties, 1999.

[22] A statement of joint purpose and co-operation was issued by the Records Management Association of Australian and the Australian Society of Archivists in the middle of the year 2000 and posted to their web sites. The competencies document can be purchased from the *Business services training web site* at www.bsitab.org. The design and implementation methodology mentioned in the next paragraph of the article can be examined on the web sites for the National Archives of Australia [www.naa.gov.au]. It was originally developed within the New South Wales Records Management Office in conjunction with the Australian Standard on Records Management, AS 4390, and is present in the International Standard Organisation's voting draft. In the standards forums I have had plenty of opportunities to make changes, but have only been responsible for some watering down introductory sentences that open up further avenues of action. The content of the DIRKS methodology is good, and it is virtually impossible to write records management standards around emerging information systems development methodologies such as prototyping, rapid application development or continuous development. There is not enough experience, yet, to draw upon and standards have to be experience based, not theoretical. [The listing of more recent methods of systems analysis as a challenge to life cycle approaches was suggested to me by a colleague, Linda Dawson, who made this a structuring theme of her introduction].

[23] See Upward. F., 'Structuring the Records Continuum - Part Two: Structuration Theory and Recordkeeping' *Archives and Manuscripts* 25 (1) 1997, also available on the records continuum research group website, www.sims.monash.edu.au/rcrg/publications/recordscontinuum/fupp2.html

[24] Loux, M.J., *An introduction to contemporary metaphysics,* Routledge, New York, 1 1998, Introduction.

[25] Loux, M. J., *ibid*, chapter six, 'Concrete particulars II – persistence through time', discusses spacetime views.

[26] The web site is being readied at the time this article was written, and will be accessible on or via the *records continuum research group site*, op.cit.

[27] Giddens, A., The constitution of society, op.cit.

[28] Foucault.M., The Archaeology of Knowledge, Harper and Row, 1969.

[29] I have appropriated the term plumbing from Phil Agre's usage of the term on the Red Rock Eater news service.

[30] Kaufer, David S. and Carley, Kathleen M. *Communication at a distance: The influence of print on sociocultural organisation and change*, Lawrence Erlbaum Associates, 1993