

# Continuum Mechanics and Memory Banks: (1) Multi-polarity

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Between 1975 and 1988 **Frank Upward** worked as an archivist, data manager, information manager and recordkeeping systems analyst in government positions and as a consultant. From 1988 until 2004 he lectured within archives, records, information management, and knowledge management specializations at Monash University. He is now semi-retired but still does some lecturing, consulting and writing. As an academic he is best known for his work on accountability and recordkeeping in the early 1990s (with Sue McKemish and Livia Iacovino) and as a records continuum theorist whose model of the records continuum is used by teachers and practitioners world-wide.

*This article explores models for continuum mechanics that can be of use within projects and knowledge and skills discovery and the organisation of knowledge, ie they can help spread the stress involved in managing recordkeeping and archiving processes. It will look horizontally (at ground cover level) at four facets of memory within recorded information, each of which has more detailed understandings disappearing vertically below the surface. These facets can be described as the recording of information as evidence, its management as information, its pushing and pulling out into public domains, and its existence within information systems as instruments of power in a society. I will be representing models that have been available in the literature or on websites for five years, but have not been specifically placed into the Australian literature before. One can of course joke about this surfeit of models. The records continuum model worked, so is this just an attack of the clones presenting a set of marginally relevant models that are attempting to cash in on a past success? If it were not for the importance of bringing archivists closer to a better understanding of information systems and to a more multi-faceted approach*

*to our memory banks this might be true, but as I begin to make clear in the article, there are major intra-disciplinary purposes starting to be defined within this cloning process. More synergy between the cognate disciplines concerned with the recording of information is needed. Of that there can be little dispute. Conceptually, however, the disciplines are still poles apart and this article will attempt to draw those poles more clearly into a common spacetime distancing framework.*

### **A note on the term topology**

In what follows I will continue with my attempts to make clear the topological nature of the models. Given how little appreciation there is in the profession about the nature and significance of the distinction between typologies, typographies, and topologies this is proving to be a difficult task. Continuum and topological thinking go hand in glove so the effort has to be made. Continuum theory as a form of general metaphysics deals with invariance on the one hand and the particular expression of that invariance in different spaces and times on the other. It brings sameness and difference into inter-dependent relationships within stories of chronologic relativity, expansion and contraction. It sets up a base for situated analysis, and that is topological thinking at least as I use the word (and the vacuum in the use of the word in the archival profession gives me some naming rights). *Topos* equals place and the modelling in this article deals with the logic of place. The models consist of a few words placed in a logical relationship with each other as a framework for 'any era - any place' situational analyses. They are not typographies. I try to keep my written descriptions of them brief. What matters is their use. Nor do they 'type' anything at least not consciously and to the extent that it is possible for me to play zero-sum language games. The models have been specifically developed to do the opposite, helping practitioners and students to see how typing occurs in particular eras or places and to organise skills, knowledge and understanding around difference and diversity, not the sameness of one era or one place. That, not simple front-ended connections with records management in our time and place, can be (and for some of us is) what records continuum theory and practice is about.

## **A note on terminology – Spacetime distancing**

I have no special meaning to give to spacetime distancing, a phrase I will use often in this article. The words are simply brought into relationship with each other to indicate the spatial and temporal movement of recorded information. In using the word vaguely I am keeping my options open about the logic of the word but it functions as a synonym for the word archiving, a word that in the archival profession is normally used with even more vagueness.

## **Perspectives on memory and even terror**

This article began like others in this journal: within a seminar directed at sharpening our perspectives of the term memory. One of the aims in that seminar was to begin differentiating more profitably between the notion of the singularity of memory in ourselves, and notions of its plurality within communities. In a sense it can be argued that memory can only exist in ourselves, in a singularity, and that we, in communities, comprise the plurality of memory.<sup>1</sup> But sociologists also regularly argue that memory exists in recorded information and this is where one finds memory's plurality as a thing. My approach to the plurality of memory in this contribution will focus on this thing and the relationship between processes and objects in its constitution.

An archivist's views of the memory contained in recorded information, like the views of any profession of memory, can be controlled by perspectives derived from outside our areas of professional skill or expertise, including those from psycho-analysis, from sociology, from legal tests of remembering, from literary philosophy (some ideas from Lacan, Derrida and Foucault spring to my mind) and from our understandings of books and libraries as memory tools.

What is more interesting to a handful of archivists is the contribution archivists can make to the study of memory. A few of us believe that this contribution might be teased out by concentrating on notions in archival theory such as those related to the act and the processes by which it is deeded to the future. It is that act and deed paradigm that I incorporated into my own records continuum modelling and in a recent work I have begun trying to shift into a broader continuum based spacetime distancing framework under the label of recordkeeping activity theory.<sup>2</sup>

Here I want to extend the spacetime approach into the study of more facets of recorded information looking at cognate disciplines and using some previously developed clones of my records continuum model. At one joking level I am doing this because I think I can. At another level I am doing it because I believe it needs to be done if continuum approaches are going to continue to help archivists pass on to the wider community more respect for the spacetime distancing role of archives. Respect for genuinely open memory banks and databases, as Jean Francois Lyotard once argued is a survival issue especially in times of expanding terror and we have been living in such times for almost a century now. Lyotard called for memory banks to be opened within zero-sum language games so that groups could compete within the plurality of memory formation on a more even basis. He saw this as a simple solution i.e. a behavioural solution based on the value of justice. Justice for Lyotard was one value he endorsed and while we all disagree with what constitutes justice, it is hard to argue that any group in society should not have appropriate access to the necessary information that can support their search for it other than by violent means. Elsewhere in these pages one will find plurality beginning to be probed by other archivists from a strengthening professional zero-sum perspective.<sup>3</sup>

### **Continuum theory, topology and mechanics**

I may be unwilling to commit in regards to the term 'spacetime distancing', but I am more willing to commit myself about the term 'continuum', I imagine I can identify its logos better than most writers, and am content to argue here that the following elements provide an adequate starting point for the examination of that logic:

- Relational continuity (not a straight line).
- A blurring of the separateness of individual points.
- Transformative change within theories of expansion, contraction and the crossing and uncrossing of thresholds (represented in my continuum modelling by circles).
- Increased complexity as the above transformative changes produce new ideas that in turn interact with existing ones to produce something new again (a sort of metaphysical Darwinism).



- Mysterious beginnings and unknown endings including theories such as 'M' theory, in which even big bang theory is converted into a theory about billions of little bangs within a recursive cycle of creation leading to the creation of universes we know nothing about.
- Changing notions of time which in the twentieth century have moved from Minkowski's four dimensional view of the spacetime continuum towards multi-dimensional approaches such as Bergsonian conceptualizations which can include four dimensions of time (past, present, future and 'becoming'), and which accept there are billions of points spatially and temporally from which one can trace movements out from time's multiple surfaces.<sup>4</sup>

The above listing of the logic of the term continuum attempts to identify invariant ways of viewing the continuum but expresses it in situated fashion using terms of my era and place (e.g. the reference to 'M' theory and the comment on circles in my models). Cosmologists, scientists, philosophers, archivists and anyone with a mind to do so can use the continuum topology analytically. It is a constant even if its constancy is based on theories of expanding complexity and the nature of theories about it is always changing in different times and places in accordance with the situational analysis component of the theory itself.

Continuum theory can even be used to address knowledge formation. My introductory use of the term 'adequate' for the above list, for example, might seem modest but is in fact boastful. Adequacy is the best one can claim for statements within continuum thinking and theory. Our statements are relative, but adequate knowledge can be derived from situated analyses, from what is described before this article began as an 'any era - any place' style of analysis, and my listing of the logos continuum, above, is derived from such an analysis, not from the usage of the term in one time and place.

It is of course easy to seize on one element of the logic of the continuum such as the notion of continuity, pretending that a simple chronologically linear movement exists from recorded information in agencies to the holding of end products in archives.<sup>5</sup> That might enable many archivists to imagine they are continuum thinkers or practitioners, but continuum archivists, at least as we have been writing about them at Monash for

more than ten years, take this 'any era – any place' approach to archiving and recordkeeping processes.

Continuum theory can be linked to structuration theories in sociology and 'postmodern' perspectives because of common concerns with the dynamics of time and place. All three ways of thinking can be said to be products of a world moving so fast (relative to past eras) that theories have to be rooted in formation, in process, in the becoming of things, rather than in their essential and abiding nature.<sup>6</sup> In what follows I am, however, going to stay mainly with continuum mechanics using the general stress spreading techniques contained in my original records continuum model rather than explore continuum theory for our times and places.

### **Time-space distancing and memory banks**

I have called this section time-space distancing rather than spacetime distancing to indicate that I am referring to a particular topology developed by Anthony Giddens for his book, *Constitution of Society*. The terminology is his, not mine, and since his topology is regularly discussed in my writing and I still find it adequate I will use it to give one form of substance to my vaguer use of the term spacetime distancing.

Giddens is one of those academics who find their facts in processes not things, and he provides a model for spacetime distancing (the vague term) in which there are four logical regions (*topos* equals place) for discussing the dynamics of social change:

1. intersections of regions and a spatial spread away from the immediate contexts of interaction
2. routinization which provides a temporal spread away from immediate contexts of interaction
3. time-space distancing
4. forms of the societal totality.<sup>7</sup>

In Giddens' theory these four regions operate interactively within what he describes as duality of structure. Forms of totality impact on immediate contexts of interaction and our contexts of interaction shape our totalities. Duality, however, was a poor choice of terms on his part. It is a multiplicity of structuring. Routinization and distancing

processes also interact with the other regions as part of the process. It is a multi-directional process, not simply a movement inwards or outwards.

My records continuum modelling transferred this approach into the making of archives although there were many influences on that modelling apart from Giddens, including discussions with my colleagues Sue McKemish and Livia Iacovino I attempted to set up a constant view of recordkeeping and archiving processes from which it was possible to construct interpretations of ways of creating documents, capturing records, organizing an archive, and pluralising archives in different places and eras, an invariant way of describing difference and the complexity of the interaction within any occurrence – or lack of occurrence – of the spacetime distancing recordkeeping and archiving processes themselves. It was a non-linear approach involving the crossing and uncrossing of thresholds, which paralogically can also be read in linear fashion as if there is sequencing out from creation. Reading the model in linear fashion, of course, ignores the multiplicity of structuring argument, but it is important in a topological model that linear thinking, a dominant mode of thinking in some of the archival professions times and places, is not shut out of any situated analysis.

The attempt to model the constitution of archives resulted in the uncovering of what Sue McKemish and I have described as the rhythm of the continuum.<sup>8</sup> The making of archives involves processes analysed within four irregular beats set out below:

- The creation of recorded information. This is the region in which interaction occurs, things are done, and the first movements in recording occur in which data including words as data elements are brought together into formal documentary structures (including the record and databases as computing textbooks define them). It is the region of action. While it is possible to read the rhythm in linear fashion and see this as the first of four regular beats, it is in fact the driving beat of transactions cycles. Capturing, organising and pluralizing processes return us recursively to creation. The other regions influence action, but they are not places where we do anything in a direct sense. Archivists preparing finding aids, like anyone creating information and recording it, operate in the action region. Understanding this

simple proposition helps set up the possibility of 'any era – any place' analyses and places recordkeepers into the picture as actors.

- The capture of recorded information. This is the place (in a logical not physical sense) where data or documents are captured as records in routine ways. This movement away from interaction is spatial, a disembedding process in which carriage through time of a record is made possible but has not yet occurred. It does not involve the carriage of the action itself (the act) but of what we choose to record about it within routines of our making (our way of deeding the act to the future). Capturing records is of course also a process of creating records, taking us back to the action region.
- The organisation of recorded information. The recording of the act in the second region might, of course, be ephemeral, but spacetime distancing, if it is taken into account, will (in accordance with Giddens' notion of duality of structure) begin to set up something more permanent and long-lasting. This region has a threshold that we begin to cross when we start to think how people not familiar with the original interactions can use the documents and records that have been deeded. This can just refer to our own personal records and how we organise them for our own later use, but in terms of the employment of recordkeepers usually refers to the data, documents and records of the organisational enterprises we work in. The third region at its furthest reaches involves the continuity of behavioural and other patterns amongst groups of people in widely dispersed locales whether the dispersal is geographical or temporal. The archive will form whether or not it is well organised but the threshold issue here is its conscious organisation without which its spreading in spacetime will be extremely erratic and ad hoc. Again organising processes take us back to creation, in this case the creation of an archive.
- The pluralisation of recorded information. The fourth region is a zone of many totalities – very many in Giddens' theory given that for him a society can be as small as twenty people or as large as a nation state. Its size can vary and one

individual can belong to many of them. It is a concept which, when translated into the making of archives, once seemed an area of dreaming exemplified by attempts to establish common archival descriptors – but now with the confluence of web-browser and internet technologies is something most of us can visualize and where pluralisation processes can be built into the creation of the documentary structures in the first place (the only practical place for it to occur as an aid to spacetime distancing).

The plural region is an area of competition. As McKemmish, Ketelaar and Gilliland-Swetland argue elsewhere in these pages, and many have argued in archival journals and bulletin tools, archivists as a profession need to consciously start addressing the power imbalances in our memory banks. Otherwise they are merely extensions of the organisational dimension. The archives as a region of pluralisation, of multiple memories, is inevitably a political place and archivists who think they can stay out of political places more often than not are taking the ultimate political stance and retreating into the archival institution as a political place at organisation level, rather than promoting the apolitical societal role of the plurality of memory as it can be found in recorded information.

The above topology (not typology) is spacetime distancing written by an archivist. It is not time-space distanciation as set out by Anthony Giddens although the two topologies share similar concerns.<sup>9</sup> In summary, if I was to draw the archivist's version as a dynamic visual model then recorded information could be seen spreading out from specific occurrences of interaction only to return to that region, shaping further actions within transaction cycles. The making and continuing access of memory banks would be part of those transaction cycles as would the making and remaking of the archive and archives.

What we record is part of memory in that it influences our action as does how we organise it and how we access the recorded information of others. Recorded information is a disembedded version of thought or action, not the thought or action itself but it is more than an object, more than an aid to memory. It is part of the processes of both acting and remembering. Giddens the sociologist is obsessed by process, but for archivists, obsessed as they must be with societal memory banks

and the way actions within them are decided to the future, process and object are intermeshed.

### **Binary polarity: process and object in recordkeeping and information management**

In 1996 two continuum models were developed at Monash University built out of the longstanding binary opposition between recordkeepers and librarians with their different ways of managing memory objects as record items and text respectively. Archivists have looked after the film, the stitched together record of action as memory, whereas librarians have looked after the weaving of text as memory.

Both models were based on spacetime distancing, on processes involving the way recorded information is disembedded from interactive occurrences and traverses spacetime, but their objects (as things *and* as purpose) are different. The first model to be developed, the records continuum model, was directed at archival purposes which in Australia had been swamped by information management and managerialist purposes in the 1980s. A number of archivists in the early to mid-1990s attempted to rescue those purposes emphasising the role of recordkeeping in accountability and exploring how this can be linked to recordkeeping and archiving processes both in records management and in archival systems of control and appraisal. The construction of a records continuum model in 1996 was part of these contestations with the crudely expressed but dominant information purposes of the time. It attempted to provide an invariant tool for situational analysis of recordkeeping and archiving processes using a topology that took into account archival objects. The result was a template providing an invariant way of explaining multiple shapes, change, and transformations in the archives.

The records continuum model will continue to have its uses as a discovery device for the analysis of records in different times and places, but it also had a paradigmatic purpose as a way of organising knowledge and skills for archival education and practice. The paradigm has been at work in our courses at Monash University for eight years, thanks to the efforts of my colleagues Sue McKemmish, Livia Iacovino, Barbara Reed, Anne Picot and Chris Hurley. It now can be seen by anyone with the publication of the book *Archives: Recordkeeping in Society*.<sup>10</sup> My initial

template version of the model is presented in Part 2 of this article within a teaching occurrence, but the model, having largely exhausted its original paradigmatic value, is presented here in prosaic tabular form (see Table 1).

**Table 1. The Records Continuum**

<i>Continuum</i>	Create	Capture	Organise	Pluralise
<i>Evidential qualities</i>	trace	evidence	corporate/ individual memory	collective memory
<i>Transactional qualities</i>	transaction	activity	function	purpose
<i>Identity</i>	actor	work unit	organisation	institution
<i>Recordkeeping Containers</i>	[archival] document	record(s)	archive	archives

Umberto Eco has argued that there is some sort of mysterious grain to the continuum that can control what is said and done,<sup>11</sup> but there was nothing mysterious about the archival grain within my records continuum model. The grain was located in the 'who did what' of human action along with the storage and recall of recorded information about those actions. It knitted together the relationships between evidence and memory and its granularity related to the nature of recorded information as an authoritative resource, something to be relied upon not because of its content but because of the way it has been created and maintained with some continuing contact to the original specificities of its occurrence. It was not just an archival grain but a continuum grain because of its topological nature, its ability to provide an 'any era - any place' method for situational analysis.

With the publication of *Recordkeeping in Society* I can now write about the paradigmatic uses of the model in the past tense. It still has present uses for teaching, but paradigms colonise knowledge and skills and this colonisation process is now more fully available for scrutiny. It is time now to cut against the grain, polishing other facets of recorded

information. The basis for this alternative grain cutting approach was established as long ago as 1996 when the structure of the dynamics of the records continuum model was re-used by Barbara Reed, Don Schauder and myself to construct an information continuum model (ICM). Like the records continuum model, the ICM was both a discovery device and a paradigm. The model's paradigmatic uses are still percolating away at Monash University so I have presented it here in my more usual template fashion (see Figure 1) in the hope that others will similarly reflect upon this aspect of its use.

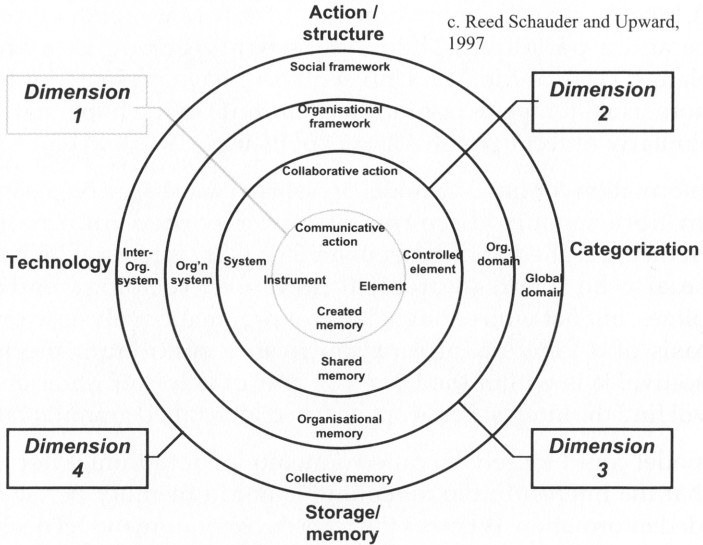
The information continuum model presents a grain based on the interest within librarianship discourse of how recorded information is represented, recalled and disseminated. It is an interest which can of course also be found in archival literature, sociology and other disciplines, but not with enough depth of pragmatic analysis to provide the basis of a view of information from a continuum mechanics perspective. It is within the literature and practices of librarians that one will find the interest being approached in detailed granular fashion.

The model could loosely be called a memory continuum if not for the fact that the interest in the modelling is not in memory per se but in recorded information. Whereas the records continuum model deals with the relationships between records, evidence and memory, this model is useful for examining text as memory (including records as text). Like the continuum model some of the terms are obvious, even banal, but they have to be if they are to function topologically. The storage/memory continuum is a case in point but the seeming simplicity of its terms becomes complex within situational analyses. (Do not expect any attempt to crystallise what I mean here. Instead try to use the model for a situated analysis and the complexities may become apparent.)

Further elements of what is almost, but not quite, a memory continuum are presented in the continuum for actions and the structure for actions. Structuration theory involves the way what we do is enmeshed recursively in what we are able to do and vice versa. This potential and restriction of potential is entirely controlled by memory traces operating in time-space distancing fashion in Giddens' theorising, or by the archive in the theories of Michel Foucault. The professional strengths of the librarian are represented by their two major areas of continuing expertise, classification processes and the use of robust technologies for the representation, dissemination and recall of objects.



Figure 1. The Information Continuum



For an information manager (or librarian, as the discipline which spawned the major variety of information management addressed in the model) the ICM may seem to be a superior model to the records continuum. For an archivist it may be seen as the inferior model. That is the sort of hierarchical classification that facet based classing avoids. Both groups should see the otherness model as a side-bar one. Together they deal with information as a resource to be allocated (the ICM) and with whether that information should or should not be given credibility as an authoritative resource (the RCM).<sup>12</sup>

That is all I will write on the model here, which may seem a short explanation (and it is) but the amount of words I could write about it or that a reader can absorb is irrelevant. It is more important that the reader can be bothered trying to 'make it dance'.<sup>13</sup> Adding words to the topology of the model will not get it off the page and into action.

## Multi-polarity: public access and information systems

Managing knowledge via binary oppositions such as the one represented by the librarianship and archival professions was adequate in its own spacetime, but not in our era of exponentially increasing complexity.<sup>14</sup> Many of us have had to adjust to a very quick movement into multi-polar spaces and times. By 1999 with a book exploring the continuum as paradigm on the drawing board, the need to be so stoutly 'Neo-Jenkinsonian' in decline as a result of the rejuvenated understandings in Australia of the place of recordkeeping and archiving processes in the management of recorded information, and the new challenge of incorporating information systems approaches to documents, records, the archive and archives still in its infancy I started to extend the spacetime distancing cloning processes. Two new models were added. One was a data continuum model built out of an interpretation of the information systems grain, and the other was a publishing continuum model.<sup>15</sup>

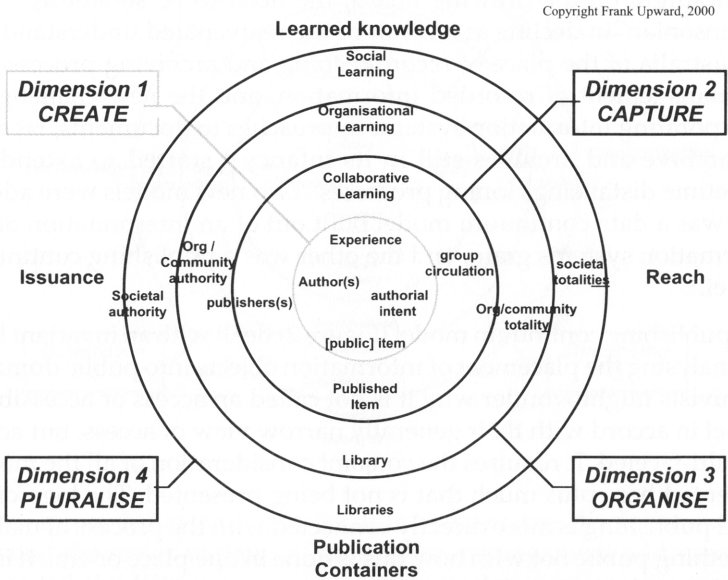
The publishing continuum model (Figure 2) dealt with an invariant logic for analysing the placement of information objects into public domains. Archivists might wonder why it is not called an access or accessibility model in accord with their generally narrow view of access, but access is multi-faceted. It requires the conjoint consideration of all the models presented here plus much that is not being presented. The logo of the word publishing is more directly connected with the process of making something public not with how this is done in one place or era. It is the job of a topological model to help find these uses and compare them. To open up this use requires the word publishing to be approached within what Jean Francois Lyotard called a 'zero-sum language game'.<sup>16</sup>

A continuum grain for making recorded information public can include the object itself, access to the experience of others contained in the object ('learned knowledge'), the authority of its issuance, and the reach it has. Each of these aspects of publishing can themselves be described within the same logical shape for spacetime distancing as the records and information models:

- **Learned knowledge** – as a continuum this can be said to be constituted by experience. The first region is the action dimension of the experience itself. The wider learning process involves its transfer within *collaborative learning*

*processes* (the sharing of the experience) and this can extend out to adoption of the knowledge through *organisational or communal learning* and further out into the meeting grounds and conflict zones of different forms of social *learning*.

**Figure 2. The Publication [Access] Continuum**



- Publication Containers** – as a continuum this begins with *[public]* items where the square bracket indicates that the intent may or may not be to make the item public. Once the item is communicated it can be said to be a *published item* (within a decentred logic of public access where published can mean knowing or inadvertently making one's own thoughts and actions available to others) Beyond that there are the normal spacetime distancing processes which can be represented within a topological model by the term *library*, a term for the container for organisational or community texts bearing in mind the argument that the word text can mean the medium on which memory is woven rather

than the mental image of it some might have in any place or era. This container in the widest reaches of spacetime can be represented by the plural term *libraries* noting that the place that the Greeks would have called a place of memory – ‘memnon’ – was called ‘libris’ in Latin. This logic is as valid for archives as places of access as it is for those things we call libraries but it is the logic of the word across time and place and the locale for detailed granular treatment of the continuum that is being sought within the models.<sup>17</sup>

- **Issuance** – which as a continuum has its source of creation within the initial interactions drawn upon and used by *author(s)*. Spacetime distancing begins with the capture of the experience within conventions by publisher(s) including software conventions within modern environments. The partly relevant term here is desktop publishing, remembering, however, that a topological continuum model for publishing should apply to all forms of recorded information in its logic, so the desktop example is only a situated reference, placing issuance into a time and place. The issuance continuum is extended if and when *organisational or community authority* is imprinted on the work (for example when a document is included on an intranet for use by staff). It enters even wider reaches of spacetime when it comes to exist within the plurality of texts as is the case with document objects as recent as today’s posting on the World Wide Web or a publicly viewable cave painting thousands of years old where the original community meanings can be deduced.
- **Reach** – which as a continuum refers to the way recorded information spreads out from *authorial intent* and can involve *group circulation*, a region in which the author loses physical control of access and authorial intent can only be protected by juridical means which as a term refers to both social and legal codes and within a situated analysis will involve different balances between the two, most noticeable in the differences between societies with few lawyers, and societies with a surfeit of them. Beyond this, spatially and temporally,

are the regions that provide the frameworks of an *organisational or community totality* and of *societal totalities* as a region of competition.

This model draws on communication theory as a suitable source for continuum mechanics and that is where one will find granular treatment of what it presents at surface level.<sup>18</sup>

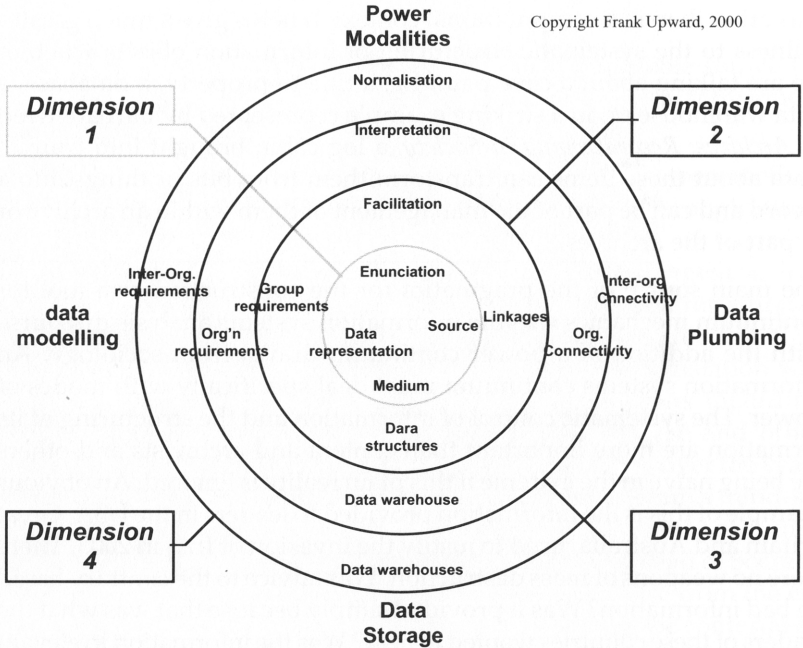
In relation to memory the publishing continuum adds in perspectives about the openness of recorded information whether through direct public availability or closure, or through the review of recorded information on the behalf of a public by means of a public agent such as an ombudsman. It is another 'any era - any place' tool for situated analyses. One can for example use these characteristics to discuss how, in my home state of Victoria, Freedom of Information legislation was introduced in the early 1980's with various provisions including publishing provisions, a spirit of the legislation clause and other elements that have been ignored, subverted, or run down over the years as different governments have operated increasingly within a mind-set dominated by closure not openness (the government would of course tell a different story). I could also use it to discuss the spread of Socratic approaches to knowledge formation in space and in time from the era and place of Socrates but the resulting story would also be contestable. (I will look at storytelling in Part 2 of this article.)

Further identifiable polarities in the making and management of all forms of recorded information can be identified as part of a data management grain within an information systems continuum (Figure 3). This continuum needs to deal with the systematic control of data but if one thinks about this only in relation to modern paradigms for computer systems and databases one is unlikely to produce an invariant model. To understand data topologically one needs to be able to get one's mind around the notion of words as linguistic data. This is not a difficult concept for archivists to understand given the structuring principles contained within the discipline of diplomatics, and should not be that difficult for others to comprehend given the supposed influence of Ferdinand de Saussure's structural linguistics on twentieth century thinking. Words as data was, however, too abstruse a concept for those analysts who constructed a dominant professional information systems paradigm in which documents were viewed as unstructured at a significant cost to common sense and to the conceptual breadth with

which they approached information systems. Accepting that words can be structured as data enables data management to be viewed across eras other than in a computational context. It helps give a much greater fullness to the systematic structuring of information objects whether we are talking about a cave painting, a title to property, a database, a data warehouse or, in a striking example represented by Barbara Reed in *Archives: Recordkeeping in Society*, a log cabin brought into court.<sup>19</sup> Data about these items can transform them from bits or things into a record and can be part of the management of them within an archive or as part of the archives.

The main source of the pragmatics for the construction of a tool for continuum mechanics was the information systems analysis discourse with the addition of a power continuum drawn from sociology. An information systems continuum must deal specifically with modes of power. The systematic control of information and the structuring of its formation are more important than content and archivists and others are being naïve in the extreme if this plain reality is ignored. An obvious example of this is the information provided to leaders in the USA, Great Britain and Australia used to justify the invasion of Iraq in 2003. There were no weapons of mass destruction. Was advice to the contrary based on bad information? Was it provided simply because that was what the leaders of these countries wanted to hear? Was the information irrelevant anyway and just a pretext for an invasion that was going to occur no matter what pretext was used? My safe guess is that no matter how questions like these are answered any adequate examination of the way the information was enunciated, facilitated, interpreted and normalised will demonstrate that the structuring and control of the information systems meant far more than its content. Indeed even in uncontentious examples the mere presence of data normalisation processes within a system will circumscribe the nature and uses of that system. Perhaps the greatest myth of the late twentieth century was that information was power; the greatest certainty of the early twenty first century (and there are very few things that are certain) is that power resides in the control of information systems.

Figure 3. The Information Systems [Data] Continuum



Apart from a fundamental and inescapable power continuum within any information system, an identifiable grain for an information systems continuum should include 'professional' continua built out of the modelling of data and the construction and management of data flow. My version of the components of such a model is as follows:

- Power modalities** – as a continuum this can start with *enunciation* as a point in the continuum which refers to both the making of a statement within an information system and to the credibility the source is given, The capture and organisation layers of the power modality reside in *facilitation* (making the system usable) and *in interpretation* (attempting to control meaning in the system and understandings derived from it). Facilitation precedes interpretation in spacetime distancing theory because if the system is not usable controlling its interpretation is an

irrelevancy. Within the pluralisation processes data *normalisation* is attempted. All of these terms possess simple practical significance in relation to the construction of information systems and broader societal significance in terms of explaining how 'information as power' operates.<sup>20</sup>

- **Data storage** – as a continuum this can be said to consist of the *medium* on which data is stored, the *data structures* in which elements are captured (this includes terms like records and databases), and, beyond this, the larger storage structures such as those represented by the term *data warehouse*, and its plurality *data warehouses*. That such terms are only beginning to emerge and be given concrete reality is an indicator of just how much electronic data management is in its infancy.<sup>21</sup> The terms, however, do not have to be pinned down to an era or any particular level of sophistication. A data warehouse as a logical model can apply to an ancient storehouse of clay tablets containing tax information just as easily as it can be applied to today's data matching computer records in a tax office.
- **Data modelling** – as a continuum this can be said to deal with entities, their attributes and relationships, which can be found in any analysis of concrete particulars from the time of Aristotle onwards. The information systems analysis technique being set out here can in fact be applied to Aristotelian metaphysics, one of the places I have tested using the model. Data modelling has taken on narrow technical meanings within many information systems textbooks but it is a longstanding human activity. The point of action in the application of such analysis is data *representation*. The way represented data is captured will depend much on the *group requirements* involved in the work processes being serviced by the system. Beyond this data will structure and be structured by *organisation requirements*. In some systems, including many well designed archives systems of the future, *inter-organisational requirements* are important in the initial design, not simply temporal add ons, pointing to a postcustodial reading of the mode.



- **Data plumbing** – as a continuum this can be said to refer to data flow, but I have used the term plumbing to make more explicit the connection between the *source(s)* at the initial level of interaction, the initial *linkages* of data sources (within the system and with users), and the pipelines (or networks) for *organisational connectivity*, and *inter-organisational connectivity* that carry the data out into wider spacetime and in to the plural region of different totalities.

The above model is not necessarily a challenging view of the information systems discourse and indeed is meant to sit on the surface above the granular detail of that discourse. It is provocative, however, in two respects.

- There is its embrace of an era independent approach which means that all forms of recording of information including today's 'document computing' processes have to be encompassed. The extension of the data grain to documents is particularly important for the power modality since documents have always been crucial to governance.
- The model emphasizes the power aspects of the spacetime distancing aspects of information systems. This is a survival issue. Information systems analysts need to pay much more attention to the requirements for the use of information in other spaces and times than they are at present or in the words of Hanrahan, 'we'll all be rooned'.<sup>22</sup>

A major challenge, then, is to get the information systems discourse (beyond its leading edge which is increasingly absorbing ideas) to include fuller understandings of all forms of recorded information and to get all analysts and their methodologies to look beyond organisational requirements for data capture.

## Conclusion

The publishing continuum and information systems continuum can be perceived to be subordinate or superior to the other models, but to repeat an earlier warning the models are not meant to represent a hierarchy. They represent facets of memory within recorded information. Any general ranking and sorting of the models is very much in the mind of those doing the ranking or sorting.

The records continuum model's paradigmatic role is now exhausted other than as a mind map that can parallel other maps. Archivists as managers and maintainers of a special type of recorded information that disembeds traces of actions into documents, records, the archive and archives are keepers of a very special flame. In recent eras the archival flame was part of a bi-polarity, with archivists occupying the bar-sinister side of memory (memories of our actions) and librarians residing on the orthodox side (memories of our thought and entertainments). Our era requires a multi-polarity of approaches that will extend and complexify throughout this century. That, however, does not lessen the importance of the flame; the need to hold on to the richness provided by the provenance derived archival grain.

The information continuum model has use as a paradigm that has not yet been published in conventional ways but is known to a limited public. The last two models seem to have had no effect on others outside of my own teaching and on students subjected to them. I have either missed the mark with them or their future has not arrived. Given the continuing, growing, and ever more complex need to open up memory banks and to curb the excesses of performance based approaches to information systems I hope it is the latter and that their time and place will come in conjunction with Lyotard's simple juridical solution in which archivists consciously work to make memory banks and databases serve justice.

Each model represents grains that need to be addressed conjointly ie, each has an underlying detailed granularity that this article addresses from surface or ground cover perspectives. The stress needs to be spread and archivists not only need to share some of it. As the group of information professionals whose expertise should be in spacetime distancing, archivists should be playing a leading role. Archivists, information managers, information systems analysts or any other group, however, are not 'good' enough to tackle these major survival issues on their own. That fact is obvious. I am writing at a time when the Queensland Government, the one of 'Heiner' infamy, is now addressing its guilt in relation to the allegedly incompetent 'Doctor Death' who was the information based darling of a Queensland hospital for the way he brought federal money in to the hospital. The fact that he did this by moving dead patients out escaped managerial statistical attention perhaps because there were no immediate dollar signs attached to

morbidity statistics. This is also of course a time when our Federal Department of Immigration seems to have regularly detained Australian Citizens in immigration detention centres, or perhaps even more perplexingly deported them.

Let us hope these current abominations are only spacetime continuum aberrations and that in different places and times the spacetime distancing of recorded information will not be as grotesque as it currently seems to be. Even if these examples are not fully typical, the need to transfer spacetime distancing perspectives into cognate disciplines and across the archival discipline itself – the need to spread the stress – should be obvious to anyone who understands the problem. Even for an optimist, however, even if the problem is seen the best we can hope is that the long road ahead to better actions will be travelled.

The coherence, the topological invariance, of the models presented here is provided by the spacetime distancing process that is the basis of the records continuum, and quite possibly of all understandings of archiving processes. Archivists can help spread the word by taking an ‘any era – any place’ style of continuum thinking to memory. Within this approach the present is neither ignored nor privileged, their own facet of recorded information (the relationship between evidence and memory) is polished, the act and deed paradigm is promoted widely, and the many facets of memory within recorded information are kept in mind. They will also need to start acting more directly in the service of the justice, looking more to the region of plurality of memory in recorded information and of competing societal totalities.

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## Endnotes

1 See Eric Ketelaar’s article elsewhere in this journal.

2 Perspectives on this interest in activity theory, act and deed in my writing and that of Luciana Duranti and Terry Cook are presented in chapter eight of Sue McKemmish, Michael Piggott, Barbara Reed, and Frank Upward (editors)

*Archives: Recordkeeping in Society*, Centre for Information Studies, Wagga Wagga, 2005. The term act and deed was popularized by the Canadian archivist Hugh Taylor.

3 When I first presented my records continuum model I presented it in conjunction with some thoughts on postmodernity from Jean Francois Lyotard but I consciously left out what, to me, was and is the greatest challenge facing all archivists because to mention it without some chance of following up on it seemed hyperbolic. Lyotard at the end of his most famous work argued that we need to work towards opening up the memory banks within zero-sum language games, levelling the playing field rather than letting the archives reflect organisational power within the current emphasis upon systems. The situation has changed in that the 'War on Terror' has made the hyperbole commonplace. With undeniable foresight Lyotard predicted that if we did not address the narrow views of information systems performativity terror would grow worse. See the concluding section (section 14) of Jean Francois Lyotard, *The Postmodern Condition* (various editions, first published in 1979). Although not specifically addressing the issue of terror, the beginning of this sort of pluralising approach can be found in the works of my colleagues Sue McKemmish and Michael Piggott in their joint conference and journal writings and in this edition in the article by McKemmish, Gilliland-Swetland and Ketelaar.

4 This is a view I am most familiar with through novels but at academic levels it can be admired in the writings of Gilles Deleuze on Henri Bergson and on cinema.

5 In this respect my life-based companion term to the continuum is lifespan, for events can occur to recordkeeping things in many different orders with many different absences and presences. (The main problem with the life cycle of records concept is that while it is useful in pointing to lifespan issues it is a nonsense conceptually, so why not use the more neutral term, lifespan, in the first place?)

6 For an example of an exploration of this condition see Bernadine Dodge, 'Places Apart: Archives in Dissolving Space and Time', *Archivaria*, Fall 1997, No. 44.

7 See chapter 8 in *Archives: Recordkeeping in Society*, pp. 198-201 where I discuss Giddens' formula in more explanatory detail.

8 This is discussed in Frank Upward and Sue McKemmish, "In Search of the Lost Tiger by way of Saint-Beuve: Reconstructing the Possibilities in 'Evidence of Me ...'", *Archives and Manuscripts* vol. 29 no.1, May 2001.

9 I tend to publish explanations of the continuum that suggest that my information processing continuum was derived from Giddens's theory of time-space distanciation which makes this connection between the two approaches seem to be a sequential one. However, when I went back to my notes a few

years ago I found (to my surprise) a drawing indicating that my initial source of inspiration for the concentric circles element of the continuum model was in fact Foucault's theory about four thresholds in knowledge formation and how the way the crossing of those thresholds is uneven, random and insecure which set me looking for similar thresholds in archival theory and practice. Foucault's theory can be found in Michel Foucault, *The Archaeology of Knowledge*, Routledge reprint, London 1995 p. 186-187.

10 In that book four chapters discuss creation of documents, capture of records, the organising of the archive, and the pluralisation of archives and four chapters look at the archival grain from accountability, juridical governance, societal power, and memory perspectives.

11 The Eco reference is from his book *Kant and the Platypus* ch. 1, section 11, The sense of the continuum. An overview of some key philosophical issues this raises about relativity in knowledge formation can be found in chapter 4, section 6.3: 'Where does the amorphous continuum lie?'

12 The hidden references to Giddens here are based on his book *The Constitution of Society*, and have been widely discussed in my work and that of my colleague Sue McKemmish. The attribution here is suppressed because the use of such terms and Giddens' theories are not because of any dependence on Giddens work in our theorizing but because his ideas provide clear continuum compatible perspectives on the relationship between recorded information and societal formation. They are useful explanatory tools.

13 This phrase comes from a seminar comment made by Chris Hurley in relation to the records continuum model.

14 I have addressed the complexity issue in chapter eight, 'The Records Continuum', in *Archives: Recordkeeping in Society*.

15 See Frank Upward, 'Modelling the continuum as paradigm shift in recordkeeping and archiving processes, and beyond' in *The Records Management Journal*, Aslib, vol. 10, no. 3, December 2000.

16 Lyotard's phrase 'zero-sum language games' is another term that by now I have used regularly in this article but am reluctant to define. In this case I like the way it conveys an aesthetic form of linguistic neutrality that I have never encountered in other phrases, and defining it would disturb the phrases poetic nature.

17 You see this library access parallel in the English language within the way some archival institutions label their reference points as reading rooms, mimicking state libraries.

18 A reference that can be cited in this respect is David Kaufer and Kathleen Carley, *Communication at a Distance: The Influence of Print on Sociocultural Organization and Change*, Lawrence Erlbaum and Associates, New Jersey, 1993.

19 *Op.Cit. Archives: Recordkeeping in Society* p. 103

20 The terms facilitation, interpretation and normalisation come from Anthony Giddens' theory – an adequate source of ideas about spacetime distancing in my view – within his discussions of signification, legitimation and domination. See Anthony Giddens, *The Constitution of Society*, Polity Press; 1984. The topological meanings that can be given to the term enunciation are present in the treatment Michel Foucault gives to this element of discourse in *The Archaeology of Knowledge, Part 2, Chapter 4*.

21 Another indicator is the infantile association of documents with paper or paper equivalents rather than with document based computing, a view presented in many information systems textbooks. Chapter four of *Archives: Recordkeeping in Society* is meant in part to address the issue of a conceptual foundation for viewing document computing in an era independent manner. Document computing is discussed there in terms of the manipulation of words as data within computer systems and the encapsulation of documentation by data as in metadata approaches to it. For historically understandable but anachronistic reasons, information systems based on documents are largely left out of most information systems and analysis design textbooks (quite an omission if you stop and think about it). When included the discussion is often very feeble stuff based on the mimicking of paper documents in electronic systems via imaging or mimicking the term database to refer to a database of documents. I have yet to see adequate explanations of electronic documents as power drivers and as work process in the published 'information systems' textbooks I have looked at and used in my teaching, although of course these notions are present in professional academic journals and in World Wide Web sources.

22 Dumping was the term that the glossary of *Keeping Archives* (second edition) wryly suggested was the dominant construct in the mind of those involved in the processes of 'archiving' electronic records. There is an irony in the way information systems texts usually ignore archiving processes except in the most perfunctory manner – the writers doing the ignoring are reflecting absences in their own discursive archive.