



AC⁺erm Project

Systematic Literature Review:
Process Aspects



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The AC*erm Project – Accelerating positive change in electronic records management' – is a research project carried out by the School of Computing, Engineering and Information Sciences in Northumbria University from 2007 to 2010. It aimed to investigate and critically explore issues and practical strategies to support accelerating the pace of positive change in managing electronic records.

The project focused on designing an organisation-centred architecture from three perspectives: (i) people, including vision, awareness, culture, drivers and barriers; (ii) working practices including processes, procedures, policies and standards; and (iii) technology in terms of the design principles for delivering effective recordkeeping.

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AC⁺erm Output

Systematic Literature Review Synthesis – Process Aspects

Background *General*

We have carried out a systematic literature review (SLR) of journal literature on electronic records management (ERM) published from 1996 to February 2009. SLRs aim for a more objective, rigorous approach to reviewing the literature. The objectivity and rigour comes from establishing elements *a priori* and following a standard process, particularly for assessing the quality of the literature and extracting relevant data.

We searched for variants of the term 'electronic records management' in the following databases: LISA (covering information studies and technology, library science and publishing); EBSCO's Business Source Premier (including coverage of business, management, engineering, law, health and art); and Web of Science (covering the sciences, social sciences & the arts and the humanities). We have reviewed 1,189 from a total of 1,756 items and selected 536, to date, for detailed review.

Information from the reviewed items have been organised into an Access database. Components of the database include: tickboxes for subject focus and for coverage of specific topics (such as model for ERM, change management) and a textual summary. Assessing the quality of the item has been through the use of tickboxes for resource type, approach type and reviewer evaluation. The use of tickboxes means that we can choose items from the database that cover specific topics only. The items on a specific topic are then synthesised by identifying themes from the summary and organising the items under appropriate headings.

Selected outputs from the SLR have been used to inform the initial questions for our Delphi studies as well as to provide practical information to enable action by users of the outputs.

This Output

Contains items of literature which have been coded as having a main focus of 'process' or as containing coverage of specific process topics, i.e. business processes, data protection, functional requirements, information access, legal and regulatory requirements, model for ERM, model for paper records, other model, risk, RM processes, standards. The items were chosen from the database on 2008/09/12. This output informed the questions for Round 1 of the Process Delphi Study.

Nature of Output Brief summaries of items from the literature, organised under headings with bibliographic details.

SYSTEMATIC LITERATURE REVIEW – SYNTHESIS OF PROCESS ASPECTS – 2008/09/12

Articles that have been coded as having a main focus of ‘process’ or as containing coverage of specific process topics, i.e. business processes, data protection, functional requirements, information access, legal and regulatory requirements, model for ERM, model for paper records, other model, risk, RM processes, standards.

Total number of articles = 177

Example of item ID code: *40 1999 HHM

- Character: # case examples, * research, £ individual expert opinion
- Number = ID number from EndNote bibliographic database
- Date
- Weighting: Resource H M L / Approach H M L /Reviewer’s Evaluation H M L, where H = High, M = Medium, L = Low

Notes:

- Some items are duplicated under different headings.
- Under each heading, items are in date order.

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GLOSSARY

DM	Document management
DP	Data protection
ECM	Enterprise content management
ECMS	Enterprise content management system
EDI	Electronic data interchange
EDMS	Electronic document management system
EDRMS	Electronic document and records management system
EHR	Electronic health record
EPR	Electronic patient record
ERKS	Electronic recordkeeping system
ERM	Electronic records management
ERMS	Electronic records management
FOI	Freedom of information
ICT	Information and communication technology
IM	Information management
RIM	Records information management
RK	Recordkeeping
RM	Records management

1. INTERACTION BETWEEN ICTs AND PROCESSES

Covers: ICTs in support of business processes; need for other associated processes, not just IT processes; ICTs create new RM processes / affect existing RM processes; ERM / ERMS integrated with business processes; business process analysis / reengineering before ERM / ERMS implementation; develop the RM infrastructure before ERM / ERMS implementation

Key issues arising from the literature:

ICTs affect processes (including RM processes) from the paper world, and create new processes. The role of ICTs (and ERM / ERMS) is to support the business and business processes. ERM / ERMS should be integrated into business processes and systems. However, there is still a need for some manual and human-based processes. When implementing ERM / ERMS, the debate is whether business analysis / business process reengineering and development of RM infrastructure need to occur before, during or after implementation.

1.1. ICTs in Support of Business Processes

*40 1999 HHM

Study of e-market place in German city. Low use of web by companies: use is for information provision but not for transactions. Citizens positive towards e-information, but not yet confident in use of online services.

Semar, W. (1999) 'An empirical study of the impact of electronic market places', Australian Academic and Research Libraries, 30 (1), pp. 30-39.

*555 1999 HHM

Data accuracy & completeness of electronic project records (EPRs) in GP practices. Pilot study in two GP practices. Validity of data depends on understanding of core data set, knowledge of coding practice.

Thiru, K., de Lusignan, S. & Hague, N. (1999) 'Have the completeness and accuracy of computer medical records in general practice improved in the last five years? The report of a two-practice pilot study', Health Informatics Journal, 5 (4), pp. 224-232.

£453 1998 MMM

EDI (electronic data interchange).

Knoppers, J. V. T. (1998) 'Electronic data interchange (EDI) ('e-commerce' and 'e-business') and records management', Records Management Bulletin, (87), pp. 18-28.

£174 2000 MMM

Current status of document management (DM) the convergence of document processing, imaging and information technologies, covers creation, modification, storage, retrieval. Includes user needs and organisational workflow. The era of work-process automation, workflow software is now here. Predict "third wave" of technologies where EDMS are catalysts for BPR (business process reengineering).

Keary, M. (2000). Review of Megill, K.A. and Schantz, H., Document management: new technologies for the information services manager. Electronic Library. 18: 148-150.

£201 2001 HMH

State of recordkeeping in sub-Saharan Africa. IT can be used to reengineer work processes: to improve services; to ensure responsible use of public sector funds.

Barata, K. & Cain, P. (2001) 'Information, not technology, is essential to accountability: electronic records and public-sector financial management', Information Society, 17 (4), pp. 247-258.

*202 2001 HHH

Effect of ICT on public sector accountability, from a value perspective. A Delphi study (1998-1999) of 30 e-recordkeeping experts. Looked at risks and opportunities of different technologies for the availability of information for accountability (i.e. Email, database management systems, office software, Web, smart systems). Responses showed presence of five organisational value conflicts: formality and informality; individual autonomy and organisational control; adaptability and continuity; cooperation and organisational autonomy; artificial authority and intellectual autonomy. Conclusions: ERM and accountability. p.266 "Emphasis on certain values may lead to advantages in some accountability situations and disadvantage or failure to use new opportunities in others. No one best way can be identified, but situation specific designs are required. The value conflicts presented in this article should be regarded as important design parameters for electronic records management."

Meijer, A. (2001) 'Electronic records management and public accountability: beyond an instrumental approach', Information Society, 17 (4), pp. 259-270.

£404 2001 HMM

The idea of an information proficient organisation p.22 "the ability of companies and other organizations to make optimal, systematic use of information to achieve strategic business goals". Article describes the components / characteristics of such an organisation. P.24 "The notion of information proficiency ... appears to be a way of giving information professionals a new base of operation within the swirling changes brought by e-business and e-government." RIM professionals should become advocates for the idea.

Dearstyne, B. W. (2001) 'E-business, e-government, and information proficiency', Information Management Journal, 35 (4), pp. 16-20, 22, 24.

£172 2001 MML

Use of XML to facilitate communication and integration of business processes. Understanding XML crucial to EDM policies / implementation.

Beesley, K. (2001) 'XML: solution for the future', Business Information Review, 18 (2), pp. 35-40.

*63 2003 HHH

Business process of Dutch governmental organisations handled via ICTs: resulted in more process information being captured. More 'transparent government' is an unintentional effect of the use of ICT to improve the support and management of business processes.

Meijer, A. J. (2003) 'Transparent government: parliamentary and legal accountability in an information age', Information Polity, 8 (1, 2), pp. 67-78.

£414 2003 MMM

P.156 "Organisations live or die by their ability to adapt to change or develop new products. New product introduction is a project or programme which needs to be managed." Discusses companies giving p.156 "priority to implementing operational systems, such as PLM (Product Lifecycle Management) and ERP (Enterprise Resource Management)" whose "main value is in steady state operation rather than the more agile environment that companies need in order to adapt." p.157 "Successful organisations are focussing on programme and project management as a discipline or department. The focus is moving to task / goal-oriented techniques, and the use of collaboration rather than critical path." Discusses programme / portfolio management (using an established methodology such as PRINCE2), knowledge

management & collaboration as the key business enablers.

Griffiths, A. (2003) *'Programme and portfolio management: the new competitive edge in product development and change management'*, *Information Management and Technology*, 36 (4), pp. 156-160.

£793 2004 MLM

Effectiveness of business intelligence systems, such as data warehouses and CRMs (customer relationship management systems), diminished or nullified by inaccurate data. Use of data-cleansing initiatives and software to ensure reliability of business data. Need to talk to business unit heads to understand processes and requirements.

D'Agostino, D. (2004) *'Getting Clean'*, *CIO Insight*, (42), pp. 72-76.

#225 2005 MMM

Implementation of a business process management system: significant cost savings.

Winzeler, S. (2005) *'Wells Fargo gallops ahead with automated loan processing'*, *Information Management and Technology*, 38 (4), pp. 169-170.

£803 2005 MML

Organisations want to be able to manage their unstructured content more like data, so that they can query it, re-use it, etc. Use of XML to format unstructured content for management within an ECM.

Siluer, B. (2005) *'Content in the age of XML'*, *Intelligent Enterprise*, 8 (6), pp. 24-29.

£812 2005 MHM

AdsML: supporting data exchange throughout the "advertising and advertisement" life cycle across all media.

Christopher, L. C. (2005) *'The Long Road from Concept to Implementation'*, *Seybold Report: Analyzing Publishing Technologies*, 5 (9), pp. 5-11.

#504 2006 MMM

Virtual case study of a local council. A document / workflow management system can lead to long term benefits (better decision making, better project management, customer service etc).

Phillips, J. (2006) *'Long-term benefits at low cost: a virtual case study for the public sector'*, *Information Management and Technology*, 39 (1), pp. 39-41.

#163 2006 HHM

Use of EDMS to facilitate e-collaboration in project-based industry in Scandinavia. E-collaboration between multiple participants. Complexities of metadata and folder structures.

Bjork, B.-C. (2006) *'Electronic document management in temporary project organisations: Construction industry experiences'*, *Online Information Review*, 30 (6), pp. 644-655.

***827 2007 HHH**

Exploiting knowledge assets and controlling workflow processes through enterprise content management (ECM). Authors developed a content management model. Model examined in non-profit organisations. P.411 "We identify the work flow process of creation, manipulation, and distribution of electronic documents in ECM systems as a lifecycle that resembles distinct phases: content of information, reification of knowledge, and an enacted element of knowledge where it is either treated as a commodity or engaged in process. These stages change the content and affect not only how it is used in the organization, but also possibly the way organizations are able to operate." Model examined in the context of nonprofit organisations. P.414 "Technology affects the ability of workers to make sense of their work and make cognitive choices. When technology structures and drives the work process, the ability for individuals to react and improvise can be limited severely. ... [for example]

methods decrease the employee (or volunteer) contact with the client, making it a less comforting, connecting experience for both. Making organizational work more like an assembly line can deskill organizational members as a result of restricted participation in work flow ... and replace the human knowledge process with an automated low-knowledge process that has difficulties adapting to change and solving problems. Process focuses on the larger picture: (1) tying reified activities back to the organizational context, (2) maintaining system knowledge on the part of organizational members, and (3) maintaining connection to mission. ... By knowing how the whole process works, organizational members are less reliant on the technology and can understand how their discrete activity ties into the larger picture." An individual organisation must consider p.415 "how an ECM system would change the organizational roles of members [clients as well as staff] and how that affects the meaning of the work they do for the organization."

Iverson, J. & Burkart, P. (2007) 'Managing electronic documents and work flows: Enterprise content management at work in nonprofit organizations', *Nonprofit Management & Leadership*, 17 (4), pp. 403-419.

£828 2007 LML

Executives from US healthcare organisations giving tips on moving to electronic payment receipt and reconciliation.

'Provider Tips for Moving to Electronic Payment Receipt and Reconciliation', (2007) *hfm (Healthcare Financial Management)*, 61 (6), pp. 1-4.

1.2. Need for Other Associated Processes, Not Just IT Processes

£201 2001 HMH

State of recordkeeping in sub-Saharan Africa. Need associated manual / procedural activities as well as the IT. IT has no innate impact on accountability: Accountability requires information and information systems, not necessarily IT.

Barata, K. & Cain, P. (2001) 'Information, not technology, is essential to accountability: electronic records and public-sector financial management', *Information Society*, 17 (4), pp. 247-258.

1.3. ICTs Create New RM Processes / Affect Existing RM Processes

***444 2001 HHH**

The ability of new radiological systems to interface with or incorporate legacy electronic and paper RK systems is a major issue; different or parallel series of records often remain and it is crucial for medical and RM staff to understand the relationships between them.

Similar problems with multiple and inconsistent RK systems are presented when hospitals merge

Traditional radiology records consist of the medical outputs (images, written and audio notes and reports) along with the administrative documents relating to requisition, scheduling, etc. Other types of record, such as patient records, may also have been used. Because radiologists are at centralized hospital locations, the record is dispersed and the images not easily accessible to the requesting doctor, who generally relies on a dictated audio report accessed by phone.

Information that could not have been captured in paper but is now captured into the e-record includes consultations and conversations conducted by e-mail, and systems metadata relating to access, downloading, and editing of records

New possibilities for creating records continue to emerge – video rather than still images, consultations held by teleconferencing, recording and transmission of annotations and commentary on images / videos. The existence of annotations could lead to different ways of writing reports and referencing information.

Understand the changing work practices arising from the use of digital media and methods

Understand the changed relationships between data elements in digital stores, so that these relationships can be maintained over time

With increasing use of electronic methods, records managers need to reassess records in the context of new communication patterns and functions that these facilitate within organisations (within radiology context)

Additional content and metadata captured into the e-record raise various legal, social and ethical issues (e.g. image becomes part of the radiology e-record).

Yakel, E. (2001) 'An institutional view of electronic records management: hospitals and teleradiology', Information Management Journal, 35 (1), pp. 26, 28, 30, 32-23.

1.4. ERM / ERMS Integrated with Business Processes

#717 1999 HMM

US federal agency. Use of / need for BPR (business process reengineering) on processes supported by the system as a means of implementing ERM. Better to plan for BPR in advance than have to do it anyway post factum. Integration of ERM into DM and workflow processes essential for good functioning. Agency-wide policy for RM. System designers must take entire records life cycle (as per schedules) into account. Records managers must take account of system life cycles when designing records life cycles / schedules.

Van Wingen, R. S., Hathorn, F. & Sprehe, J. T. (1999) 'Principles for information technology investment in U. S. federal electronic records management', Journal of Government Information, 26 (1), pp. 33-42.

£#250 2004 HMM

Discussion of need to align EDRMS requirements with the business, with 2 case examples.

Asprey, L. (2004) 'Information strategies: are we aligning the business case with enterprise planning?', Records Management Journal, 14 (1), pp. 7-13.

£#534 2005 MMM

Business benefits of ERM in ECM context moving from defensive, risk management justification / rationale for records management to offensive, positive benefits rationale for RM. Gives three USA case examples: DARPA (Defense Advanced Research Projects Agency), Nuclear Regulatory Commission's (NRC) ADAMS (Agency-wide Document Access & Management System) and NRC's public key infrastructure e-signature capability. Argues that as an organisation "comes to understand the quality and value of the information held in the ERMS within the ECM" e-records repositories will become the primary place for information supporting business and solving new problems. "The financial savings to the enterprise and costs foregone through re-purposing information already captured and accessible will be readily demonstrable to Chief Information Officers. Emphasizing the positive benefits of EMRS within ECM will bring records management to its proper place in serving enterprise goals and mission."

Sprehe, J. T. (2005) 'The positive benefits of electronic records management in the context of enterprise content management', Government Information Quarterly, 22 (2), pp. 297-303.

1.5. Business Process Analysis / Reengineering Before ERM / ERMS Implementation

#717 1999 HMM

US federal agency. Use of / need for BPR (business process engineering) on processes supported by the system as a means of implementing ERM. Better to plan for BPR in advance than have to do it anyway post factum.

Van Wingen, R. S., Hathorn, F. & Sprehe, J. T. (1999) 'Principles for information technology investment in U. S. federal electronic records management', Journal of Government Information, 26 (1), pp. 33-42.

£297 2003 HMM

EDMS. Automated indexing for retrieval of records, with no structured records system being required is inadequate. User addition of metadata is expensive and inaccurate. Solution is a directory structure (with a hierarchical representation of functions, activities, processes, projects, record series etc.) embedded within the metadata. Full functional analysis of the organisation and production of a classification scheme is a key component of ERM.

Moss, M. & Tough, A. (2003) 'Metadata, controlled vocabulary and directories: electronic document management and standards for records management', Records Management Journal, 13 (1), pp. 24-31.

1.6. Develop the RM Infrastructure Before ERM / ERMS Implementation

£478 1996 HML

African states' paper recordkeeping is in disarray. What will be the effect of automation? P.4 "automation applied to an inefficient operation will magnify the inefficiency." p. 5 "Putting the existing system in order has to come first. ... In many cases implementing a record management programme to improve the existing paper records is a cheap and cost effective way of preparing for successful computerisation." Infrastructural and resource problems mean that IT solutions are not necessarily the best approach in Africa. Donor agencies' consultants attempt to work around the problem by ignoring the paper based systems and building new computer systems. This attempt to transfer a technical strategy direct from developed societies without real consideration of the circumstances on the ground has serious consequences. Because no significant research is being carried out on the means of establishing linkages between paper and electronic records systems, there will increasingly be situations where neither system is complete."

Cain, P. (1996) 'Making the transition to the electronic age: managing electronic and paper records as a strategic resource for good government in developing countries', Information Technology for Development, 7 (4), pp. 159-167.

#220 2000 HML

Finland's Defence Forces ERM project. Need to set up the RM infrastructure before you can successfully implement ERM. When business functions automated, no concern for the long-term evidentiality and preservation of the information created and handled by these systems.

Kikki, J. (2000) 'A new model for electronic recordkeeping in the Finnish defence forces', Records Management Journal, 10 (3), pp. 150-160.

#526 2003 MML

UK Health and Safety Executive (HSE) in preparation for the required implementation of EDM. Working on its records plan via functional analysis and development of taxonomy.

Haynes, D. (2003) 'Managing records, function, cultural and technical change', Library + Information Update, 2 (8), pp. 44-45.

£297 2003 HMM

EDMS. Automated indexing for retrieval of records, with no structured records system being required is inadequate. User addition of metadata is expensive and inaccurate. Solution is a directory structure (with a hierarchical representation of functions, activities, processes, projects, record series etc.) embedded within the metadata. Full functional analysis of the organisation and production of a classification scheme is a key component of ERM.

Moss, M. & Tough, A. (2003) 'Metadata, controlled vocabulary and directories: electronic document management and standards for records management', Records Management Journal, 13 (1), pp. 24-31.

#502 2005 HHH

Full-scale overhaul of recordkeeping procedures at PRONI (Public Records Office Northern Ireland) culminating in implementation of EDRMS. Regaining corporate control over RM processes, using methodology contained in ISO 15489 and DIRKS: development of functional classification scheme; re-introducing good RM procedures; information audit and ER questionnaire; analysing organisational business activities and identifying records requirements; file classification carried out, to allow application of retention periods; document naming conventions.

Smyth, Z. A. (2005) 'Implementing EDRM: has it provided the benefits expected?', Records Management Journal, 15 (3), pp. 141-149.

2. RECORDS MANAGEMENT / RECORDKEEPING

Covers: organisational RM policies and processes; RM processes poor or lacking; developing records management / recordkeeping

Key issues arising from the literature:

In many organisations RM policies and processes are poor or lacking. There are many reasons for this, e.g.: lack of interest / awareness on the part of managers / staff; lack of resources devoted to this activity, particularly in developing countries with poor overall infrastructures and resources. There are also occurrences where RM / RK has broken down because of the introduction of ICTs or the destabilising effect of political upheaval.

2.1. Organisational RM Policies and Processes

#717 1999 HMM

US federal agency. Agency-wide policy for RM.

Van Wingen, R. S., Hathorn, F. & Sprehe, J. T. (1999) 'Principles for information technology investment in U. S. federal electronic records management', Journal of Government Information, 26 (1), pp. 33-42.

£765 2004 HLL

Interviews with three chief information officers: CIO1 = School + Storage Networking Industry Association; CIO2 = Law firm; CIO3 = US National Archives and Records Administration (NARA). APPROACH TO MANAGING E-RECORDS. CIO1: waking up to the need for a strategy for ERM. CIO2: have an ERM policy. CIO3: Piloting software, but current policy is printing and filing. BIGGEST CHALLENGE IN ERM. CIO1: cost and lack of desire to fund this. CIO2: Selective deletion of records. CIO3: integrated software. easy natural methods of filing. WHO SETS ERM POLICIES / PROCEDURES. CIO1. Multi-departmental. CIO2. legal counsel, records dept, IT all together. CIO3. Multi-departmental. lead by RM. WHAT HELP REQUIRED FROM RM / IT. CIO1. p.34 "I want the philosophical and legal framework of a clearly articulated records management policy to drive our technology, not vice-versa." CIO2. RM staff to become more familiar with IT. RM to become responsible for e-records as well as paper. CIO3. RM set policies / strategies, IT helps to implement them.

Swartz, N. (2004a) 'From the mouths of CIOs', Information Management Journal, 38 (5), pp. 30-36.

2.2. RM Processes Poor or Lacking

£478 1996 HML

African states' paper recordkeeping is in disarray. What will be the effect of automation? P.4 "automation applied to an inefficient operation will magnify the inefficiency." p. 5 "Putting the existing system in order has to come first. ... In many cases implementing a record management programme to improve the existing paper records is a cheap and cost effective way of preparing for successful computerisation." Infrastructural and resource problems mean that IT solutions are not necessarily the best approach in Africa. Donor agencies' consultants attempt to work around the problem by ignoring the paper based systems and building new computer systems. This attempt to transfer a technical strategy direct from developed societies without real consideration of the circumstances on the ground has serious consequences. Because no significant research is being carried out on the means of establishing linkages between paper and electronic records systems, there will increasingly be situations where neither system is complete."

Cain, P. (1996) 'Making the transition to the electronic age: managing electronic and paper records as a strategic resource for good government in developing countries', *Information Technology for Development*, 7 (4), pp. 159-167.

£453 1998 MMM

EDI (electronic data interchange). Involvement of different localities / countries, jurisdictions and languages. E-records are often produced and transmitted without reference to any RM procedures. Need to advocate and implement corporate-wide RM principles.

Knoppers, J. V. T. (1998) 'Electronic data interchange (EDI) ('e-commerce' and 'e-business') and records management', *Records Management Bulletin*, (87), pp. 18-28.

£745 1999 MML

Research libraries / archives. Worry that internet search is being sold as "fast track to information" and that untrained researchers will not look beyond it for sources. Need for traditional arrangement / description for collection search. Archivists need to work with writers to have clear trail from creation to preservation for future researchers.

Zeidberg, D. S. (1999) 'The archival view of technology: resources for the scholar of the future', *Library Trends*, 47 (4), pp. 796-805.

#717 1999 HMM

US federal agency. While IT systems design often does not take RK needs into account, this must be an element for federal IT systems, with legal RK requirements.

Van Wingen, R. S., Hathorn, F. & Sprehe, J. T. (1999) 'Principles for information technology investment in U. S. federal electronic records management', *Journal of Government Information*, 26 (1), pp. 33-42.

#582 2000 MMH

German reunification - problems of preserving East German archives of e-records.

Wettengel, M. (2000) 'Archiving the united Germany: 1. German unification and electronic records: the example of East Germany's 'Kaderdatenspeicher'', *Records Management Bulletin*, (95), pp. 11-16.

£201 2001 HMM

In sub-Saharan Africa effectively there has been a collapse in the recordkeeping systems. Use of IT only makes this situation worse.

Barata, K. & Cain, P. (2001) 'Information, not technology, is essential to accountability: electronic records and public-sector financial management', *Information Society*, 17 (4), pp. 247-258.

***730 2001 HHH**

Survey of US librarians. Lack of awareness of legal issues associated with public library records. Recordkeeping part of daily operational activities that is often overlooked. Although records are being maintained, best practices are not being followed. Recordkeeping not understood as a form of accountability. Little awareness of records as vital to business continuity. Institutional records only included in 2 libraries' disaster plans, though not known how many actually had disaster plans.

Yakel, E. & Colligan, C. A. (2001) 'Public library records: issues of accountability and access', *Public Library Quarterly*, 19 (4), pp. 5-20.

***31 2004 HMM**

Research into management of e-records in SMEs in South Africa. P.18 "the owners / managers ... are sufficiently aware of the importance of information for their businesses, but that retrieving the necessary internal as well as external information is a problem." Barriers include lack of organised filing structures, lack of RM tools. P.19 "Most businesses have not realized that poorly designed information organization systems are the reason for the

difficulties experienced in retrieving information. Those that have realized that these systems may be the problem do not know what to do about it."

Denner, L. & van der Walt, M. S. (2004) 'The organization of electronic information in selected small, medium and micro enterprises (SMMEs) in South Africa', Knowledge Organization, 31 (1), pp. 4-25.

#748 2005 HMM

US government sector case examples. Resourcing for RM has often been inadequate.

Young, J. (2005) 'Electronic records management on a shoestring: three case studies', Information Management Journal, 39 (1), pp. 58-60.

#371 2005 HML

Hutton / Butler inquiries raised serious concerns about UK government record-keeping procedures. Government RM policies and standards do not appear to have been followed. Only the Cabinet Secretary, the Head of the Civil Service, and other permanent secretaries can ensure that proper RM is undertaken at the highest government levels.

Moss, M. (2005) 'The Hutton Inquiry, the president of Nigeria and what the butler hoped to see', English Historical Review, 120 (487), pp. 577-592.

2.3. Developing Records Management / Recordkeeping

£445 2001 HML

Discussion of privacy in the e-environment with a focus on using privacy rights to help RIM professionals reclaim ERM territory encroached on by IT.

Booz, C. R. (2001) 'Electronic records and the right to privacy', Information Management Journal, 35 (3), pp. 18, 20-12, 24.

***380 2004 MHM**

Recordkeeping project in the authors' organisation developed a model to aid the aim of p.71 "the information professional trying to instil good record-keeping behaviour in their colleagues for whom record-keeping is not the primary focus of their normal duties". Five pillar strategy, as part of a change management strategy: p.71-2 "in order to establish a new set of processes ... more aligned to ad-hoc business practices followed by our business and research users of the system".

Lanham, P., McCaskie, R. & Sanderson, R. (2004) 'Towards a model for sustainable record keeping practices', Records Management Bulletin, (120), pp. 7-9.

3. ELECTRONIC RECORDS AND ELECTRONIC RECORDS MANAGEMENT

Covers: international / national state of play, strategies, policies; standards, guidelines

3.1. International / National State of Play, Strategies, Policies

Key issues arising from the literature:

Governments and supra governmental bodies have invested in technical and organisational infrastructures, position papers, strategies, policies and initiatives, including funding of research, to support the introduction of e-records, particularly for the e-government agenda. Challenges for national / international co-operation are caused by factors such as different legal systems, different organisational structures and different views on RM and archives.

Items below are arranged in chronological order to show historical developments.

£709 1997 HMM

Status of ERM in Europe at the time of writing. Largely covering work of the national archives. Differences between the countries, caused by factors such as different legal systems, different organisational structures and different views on RM and archives. This affects how they deal with e-records. Response is patchy and low key. It appears that European archives have so far only accessioned government databases. P.206 "There is also a gulf between the major theoretical initiatives, mainly from North America, and the practical implementation of the results." View of State archivist of Netherlands that p.206 "the recordkeeping function, which includes the archival function, needs to be redefined in the electronic environment" basing his view on 3 projects: Pittsburgh Project (accountability and functional requirements), University of British Columbia project (reliability and authenticity using traditional diplomatics and archival science techniques), ICA Committee (work on strategies for the archival function). P.214 "Future developments in electronic records in Europe must take account of four major factors ... The first is an increasingly supra-national legal system, the second is increasing amounts of data flowing across national borders, the third is the conflicting demands of privacy and oneness, and the fourth is the spread of privatisation of state functions. These new conditions pose a challenge for increased co-operation across national boundaries, between the public and private sectors and between the different information professions."

Mackenzie, G. (1997) 'Electronic records: the European dimension', Records Management Journal, 7 (3), pp. 205-216.

£728 1997 HMM

Australia's approach to ERM in the 1990s. Prior to 1990s recordkeepers had not addressed e-records. Even though IT might have been used to create documents 'official' records were paper. REINVENTING RECORDS MANAGEMENT. Development of the records continuum approach. Leading to AS 4390, the RM standard. In 1996 the Kirribilli Statement p.194 "by the year 2000 all Australian organisations will follow guidelines and standards for the management of electronic records which are based on common principles, concepts and criteria." WORKPLACE REALITIES. P.197 "While the packages are now offering increased capacity to manage electronic documents, the majority of organisations are wary of the solutions proposed and have not yet integrated the electronic and paper worlds." Technological changes happening at an incredible rate. Computers on every desk, use of email, organisations interested in information dissemination and sharing. Working practices into smaller groups and teams not rigid bureaucracies. EDMS and workflow software.

Intranets and extranets. Electronic commerce, electronic data interchange, document interchange. Information infrastructure being addressed at government level. RM often thought as relevant only to the paper world. Packages sold as addressing p.197 "all the information needs of organisations without the need for records management."

Recordkeepers fighting to be heard. Trying to integrate different packages to address RM requirements. Traditional records management packages are document management packages. Some strategic approaches, e.g. government specification for RM software.

ARCHIVES AND ELECTRONIC RECORDS. Government archives involved in the strategic direction of electronic recordkeeping. Leading Australian archival institutions have adopted a policy of distributed custody for e-records.

Reed, B. (1997a) 'Electronic records management in Australia', Records Management Journal, 7 (3), pp. 191-204.

£219 1999 HML

ERM in the Netherlands. 1991 strategy for RM in the civil service 'Revolution in Records' - RM is part of the wider IM; emphasis is on business processes; content and usage takes precedent over form and media. Civil Code requires keeping of certain types of records for specified periods, and these can be e-records. Archives and RM are melding and the distinctions are disappearing. Adoption of the life cycle concept. 1991 Dutch General Auditor's Office MLG report on long-term preservation of e-records, resulting in the Dutch Digital Longevity Programme. 1995 the programme wrote a report 'The end of the paper era' which stated that the problem was so large and complex that there was no single technical solution for all situations. In 1996 the programme produced recommendations for dealing with this problem, including a policy and an office to support / stimulate initiatives, pilot projects, R&D and to provide advice and information.

Stephens, D. O. (1999) 'Archives and records management in the Netherlands', Information Management Journal, 33 (4), pp. 64-66, 68-69.

£406 2000 HMM

"looks at issues facing recordkeeping in an electronic transactions environment, relating this to [Australian] Federal government operations. It also challenges some of the archives and records professions' views and expectations about how others might see the importance in the detail of electronic recordkeeping, especially in an era of 'light-touch' legislation to enable the development and uptake of e-commerce" (abstract). Discusses how RK principles were not considered in Australian government's development of the Electronic Transactions Act 1999 to support e-commerce.

Stuckey, S. & Liddell, A. (2000) 'Electronic business transactions and recordkeeping: serious concerns; realistic responses', Archives and Manuscripts, 28 (2), pp. 92-109.

£603 2000 HMM

Collaborative research initiatives in Australia in mid-late 1990s viz. national policies & standards (AS4390, 1996, ACA's Common Framework for Electronic Recordkeeping, 1996; Records & Archives Competency Standards, 1997; Documenting the Future: Policy and Strategy for Electronic Recordkeeping in the New South Wales Public Sector, 1995; Managing Electronic Records: a shared responsibility, 1995; Keeping Electronic Records, 1995; plus many NSW guidelines & NAA standards / policies); SPIRT metadata project 1998-99; VERS project 1998-99; Monash University's Enterprise Information Research Group (EIRG) to bring researchers & industry together; & (on a larger scale) Australian Government's DSTC (Distributed Systems Technology Centre) as an umbrella for research into technical infrastructure for "enterprises of the future" (p365). Initial work has been to develop policies and standards to provide a framework for individual organizations, also to encourage education and research programmes "including research and development in the recordkeeping community".

McKemmish, S. (2000) 'Collaborative research models: a review of Australian initiatives', American Archivist, 63 (2), pp. 353-367.

£443 2001 MMM

Looking at e-government programmes worldwide. These developments supported by standards for IT and IM. Author suggests governments should use ISO 15489 to make sure their RM is of good quality.

Steemson, M. (2001) 'Global experiences: what we can learn from other people', Records Management Bulletin, (105), pp. 25-27, 29-32, 34-26.

£498 2001 MLH

Discusses development of electronic records strategy and policy in Archives New Zealand (ANZ) from 1997 onwards.

Cauchi, J. (2001) 'Whither Archives New Zealand's electronic records policy?', Archifacts, (Oct 2001), pp. 42-52.

£231 2001 HML

Malaysian Government's implementation of e-government (EG) and the National Archives of Malaysia's efforts to address related RM issues. Though going ahead with e-government via the Multimedia Super Corridor (MSC) project and therefore requires the use of e-records and e-transactions, government administration is still using legacy systems. National Archives has through lobbying got government to recognise that they need to be part of the MSC mechanism, and becoming a member of the Government IT and Internet Council. Repositioning of the National Archives of Malaysia within the EG mechanism. A proposal submitted to government to set up an electronic records centre, jointly with international experts. Setting up a National Committee on Preservation of Electronic Records. Reorganised its administrative structure and set up the Electronic Records Management and Information Technology Division. Published standards and guidelines on email management. Now need to set up policies. Research on the Malaysian context is also needed to inform what is required.

Johare, R. (2001) 'Electronic records management in Malaysia: the need for an organizational and legal framework', Records Management Journal, 11 (2), pp. 97-109.

£*198 2003 LHM

Review of report 'Better Access to Electronic Information for the Citizen: the Relationship Between Public Administration and Archives Services Concerning Electronic Documents and Records Management. INSAR, Supplement V'. Questionnaire study carried out by Essex University on behalf of EC, to respond to call from DLM for comprehensive study of relationship between public administration and archive services re EDRM. Summarises results of survey of state archives across EU, with more detailed case studies of Finland, Germany, Netherlands, Sweden, UK. Builds on earlier 1996 DLM survey. New study shows only 6 states had dedicated ER repositories, and holdings consisting almost entirely of structured statistical databases. Report makes clear that success rests on integrating appraisal, transfer and preservation of ERs held in office systems. Present study shows differences in legislative frameworks, despite pan-national directives, and arises from e.g. different access rights under FOI or secrecy legislation. Report includes detailed discussion of legislative frameworks, ER holdings, guidelines, transfer to archives, and training. Wider issues of ER also discussed.

Barata, K. (2003). Better access to electronic information for the citizen: the relationship between public administration and archives services concerning electronic documents and records management. Review of Schurer, K., INSAR Supplement V. Journal of the Society of Archivists. 24: 107-108.

£87 2003 MML

Describing the UK's e-government policy – development in approach since 1999.

Bennett, J. & Cirell, S. (2003) 'The development of e-government policy for local authorities', Legal Information Management, 3 (2), pp. 80-82.

#550 2004 HHH

NZ national strategy for healthcare and information management. Integration requires 6 basic ICT requirements: full interoperability; data security; privacy & protection of personal information; data standards; coordination of system architecture; organisational reengineering.

Gauld, R. (2004) 'One step forward, one step back? Restructuring, evolving policy, and information management and technology in the New Zealand health sector', Government Information Quarterly, 21 (2), pp. 125-142.

£673 2004 HLL

ERM activity in Europe.

Waldron, M. (2004) 'Adopting electronic records management: European strategic initiatives', Information Management Journal, 38 (4), pp. 30-32, 34-35.

#333 2006 HML

Development of RM at the French National Library. Set up a new service devoted to RM and archives attached to the CEO.

Dherent, C. (2006) 'Document management at the French National Library', Records Management Journal, 16 (2), pp. 97-101.

*234 2006 HHM

Cross-sectional study of national archives in East and Southern Africa Regional Branch of the International Council on Archives (ESARBICA). Countries at a disadvantage with ERM: lack expertise, resources and facilities and paper systems often in chaotic state. p.69 "As a result the management of electronic records has been greatly neglected in many countries in sub-Saharan Africa. p.76 "Although electronic records are proliferating throughout government, many archival repositories have not yet addressed the implications of the management of digital materials. ... There is need for quick action if the loss of ESARBICA's electronic memory is to be averted."

Ngulube, P. & Tafor, V. F. (2006) 'The management of public records and archives in the member countries of ESARBICA', Journal of the Society of Archivists, 27 (1), pp. 57-83.

3.2. Standards, Specifications, Guidelines

Key issues arising from the literature:

Much work has been undertaken to develop standards, regulations / requirements, guidelines and guidance of all types. These cover ERM directly, but such developments from related fields in IT / IM are also applicable.

Some key examples covered here include: guidance from national archives (The National Archives (UK), the National Archives and Records Administration (NARA) (US), the National Archives of Australia); the Sedona Guidelines: Best Practice Guidelines and Commentary for Managing information and Records in the Electronic Age; VERS (the Victorian Electronic Records Strategy) (Australia); the RM standard ISO 15489 (and the earlier AS 4390) plus associated documents; BIP0008 (previously PD0008, now BS 10008) on legal admissibility and evidential weight of information stored electronically; PD0010 Principles of good practice for information management (UK); DIRKS (Designing and Implementing Recordkeeping Systems) (Australia); MoReq Specification (Model requirements for the management of electronic records) (EU); Department of Defense

(DoD) Records Management Application Design Criteria Standard (US); XML (Extensible Markup Language) and other technical specifications and standards.

Items below are arranged in chronological order to show historical developments. E.g. the development of BIP0008 (UK); the changing approach of TNA (UK) to offering an evaluation programme for ERMS against their functional requirements.

£595 1996 MML

Practitioner's viewpoint of DISC PD0008 Code of Practice for Legal Admissibility of Information Stored on Electronic Document Management Systems (UK). P.22 "It would be beneficial to see suppliers of EDM systems taking the Code on board and referring to it when selling and implementing systems, and those organisations starting off now on the road towards EDM are definitely at an advantage with this Code."

Keenan, H. (1996) 'A user interprets', Records Management Bulletin, (76), pp. 18-22.

£460 1997 HMM

Discussion of successful approaches to ERM. Numerous standards being developed to produce secure and trustworthy e-records, e.g. CORBA, DCOM, AIIM Standards Committee C22, DMA, ODMA, p.[4-5]. E.g. of high level guidance document is 'Records Management Requirements for Electronic Record Keeping' produced by US National Archives and Records Administration (NARA).

Phillips, J. T. (1997) 'Do electronic objects create business risk?', Records Management Quarterly, 31 (1), pp. 37, 40-42.

£598 1998 MMH

Description of PD0008 Code of Practice for Legal Admissibility of Information Stored on Electronic Document Management Systems (UK). Covers data files stored on Write Once Read Many (WORM) optical storage systems and also CD-R systems. Storage of images of documents, with original paper version being destroyed. But being rewritten to cover all kinds of storage technologies, plus to become an ISO document. Supported by Compliance Workbook (PD0009) for records managers and for bosses Principles of Good Practice for Information Management (PD0010).

Steemson, M. (1998) 'Legal admissibility of information stored on electronic document management systems, or how to make the law love your image', Records Management Bulletin, (87), pp. 49-60.

£353 1999 MML

New code: PD0008:1999 'Legal admissibility and evidential weight of information stored electronically' (UK) updates 'Code of practice for legal admissibility of information stored on electronic document systems.

Steemson, M. (1999) 'Better code for legal admissibility: flawed, but vital to wannabe KM professionals', Records Management Bulletin, (92), pp. 5-8.

#717 1999 HMM

Using business process reengineering (BPR) as a means of implementing ERM. The Environmental Protection Agency (EPA) (US) case: workflow and ERM. Used US Department of Defense (DoD) standards for ERM software design. Agency revised internal RM in 1997 and proposed agency-wide policy for ERM, using draft of DoD standards and guidance from NARA.

Van Wingen, R. S., Hathorn, F. & Sprehe, J. T. (1999) 'Principles for information technology investment in U. S. federal electronic records management', Journal of Government Information, 26 (1), pp. 33-42.

£277 2000 HMM

National Archives of Australia's standards and policies for RM, including ERM. P. 199 "The purpose of the Archives 'e-permanence' initiative has been to develop a range of interrelated standards, policies and guidelines that provide government departments and agencies with the intellectual framework to manage their information resources, including their federal records, in an integrated way." Initiatives include: Australian Government Locator Service (AGLS) = resource discovery standard. Australian Government Interactive Functions Thesaurus (AGIFT). Recordkeeping Metadata Standard for Commonwealth agencies. Generic recordkeeping issues dealt with by Designing and implementing recordkeeping systems: A manual for Commonwealth agencies (DIRKS).

Robertson, A. & Cunningham, A. (2000) 'Documenting the business of Government: archival issues in the digital age', Australian Academic and Research Libraries, 31 (4), pp. 188-201.

£603 2000 HMM

Collaborative research initiatives in Australia in mid-late 1990s viz. national policies & standards (AS4390, 1996, ACA's Common Framework for Electronic Recordkeeping, 1996; Records & Archives Competency Standards, 1997; Documenting the Future: Policy and Strategy for Electronic Recordkeeping in the New South Wales Public Sector, 1995; Managing Electronic Records: a shared responsibility, 1995; Keeping Electronic Records, 1995; plus many NSW guidelines & NAA standards / policies); SPIRT metadata project 1998-99; VERS project 1998-99; Monash University's Enterprise Information Research Group (EIRG) to bring researchers & industry together; & (on a larger scale) Australian Government's DSTC (Distributed Systems Technology Centre) as an umbrella for research into technical infrastructure for "enterprises of the future" (p365). Initial work has been to develop policies and standards to provide a framework for individual organizations, also to encourage education and research programmes "including research and development in the recordkeeping community".

McKemmish, S. (2000) 'Collaborative research models: a review of Australian initiatives', American Archivist, 63 (2), pp. 353-367.

£355 2001 HML

XML and its relationship to MARC records. 130 10746 Reference Model for Open Distributed Processing (RM-ODP), IEEE's enterprise ontology specification 1471.

Gardner, J. R. (2001) 'Information architecture planning with XML', Library Hi Tech, 19 (3), pp. 231-241.

£443 2001 MMM

Looking at e-government programmes worldwide. These developments supported by standards for IT and IM. Author suggests governments should use ISO 15489 to make sure their RM is of good quality.

Steemson, M. (2001) 'Global experiences: what we can learn from other people', Records Management Bulletin, (105), pp. 25-27, 29-32, 34-26.

£445 2001 HML

Focuses on using privacy rights to help RIM professionals reclaim ERM territory encroached on by IT. A better approach than that of achieving common definition of privacy might be to consider standards and best practices in managing electronic records to ensure the protection of privacy within a given context. The slowly emerging standards for electronic recordkeeping systems, such as US Department of Defense (DoD), assist in managing the records of business activities in this way.

Booz, C. R. (2001) 'Electronic records and the right to privacy', Information Management Journal, 35 (3), pp. 18, 20-12, 24.

£324 2002 HLL

Guidance at that time (2002) from the British Standards Institution (BSI) on ERM. ISO 15489 (RM standard) and associated effective records management series. PD0025. BSI PD 0008 - code of practice on legal admissibility of e-records. BSI PD 0010 Principles of good practice for information management. BSI PD 5000. E-commerce issues for ERM applicable at international level.

Shipman, A. (2002) 'Managing e-mail and e-commerce records', Records Management Journal, 12 (3), pp. 98-102.

£695 2002 HML

MoReq Specification (Model requirements for the management of electronic records) (EU) - critique.

Cain, P. (2002). Model requirements for the management of electronic records (MoReq): a critical evaluation. Review of Fresko, M. & Waldron, I., Model requirements for the management of electronic records (MoReq). Records Management Journal. 12: 14-18.

***165 2003 HMM**

Use of XML schemata accessed via a relational database to integrate elements using different metadata systems into a single flexible repository / catalogue.

Chen, R.-S., Lu, K.-Y. & Yu, S.-C. (2003) 'Metadata management system: design and implementation', Electronic Library, 21 (2), pp. 154-164.

£687 2003 MMM

Updating of code on legal admissibility of electronic records, now BIP 008:2004 (UK) (previous versions 1996, 1999). Covers storage of all electronic documents, including e-records. Covers all aspects of the IM system. Cross referenced to ISO15489. Compliance workbook BIP 0009:2004. Also development of ISO/TR 15801 Electronic imaging - information stored electronically.

Shipman, A. (2003) 'Legal admissibility of electronic records: revised BSI Code of Practice', Records Management Bulletin, (117), pp. 7-10.

£238 2005 HMM

Describing the 'Sedona Guidelines: Best Practice Guidelines and Commentary for Managing information and Records in the Electronic Age'. Focuses on the legal imperatives for compliance with a US focus.

Allman, T. Y. (2005) 'Fostering a compliance culture: the role of the Sedona Guidelines', Information Management Journal, 39 (2), pp. 54-56, 58, 61.

#502 2005 HHH

Full-scale overhaul of recordkeeping procedures at PRONI (Public Records Office Northern Ireland) culminating in implementation of EDRMS. Worked to ISO 15489 as standard and using the DIRKS (Designing and Implementing Recordkeeping Systems) (Australia) methodology. EDRM software had to meet The National Archives (UK) (TNA) functional requirements.

Smyth, Z. A. (2005) 'Implementing EDRM: has it provided the benefits expected?', Records Management Journal, 15 (3), pp. 141-149.

£520 2005 HLM

Describes work and programme of US National Archives and Records Administration (NARA). Having been involved in the development of ISO 15489, NARA has incorporated the standard in its activities, promoting its benefits to agencies and officials. ISO 15489 to be integrated into revision of NARA RM regulations.

Weinstein, A. (2005) 'NARA enters new "ERA" of electronic records management', Information Management Journal, 39 (5), pp. 22-24.

£659 2005 MLL

Overview by The National Archives (TNA) (UK) of the TNA evaluation schemes to assess whether an ERM product is compliant with their generic requirements for ERM systems. Requirements published in 1999, updated in 2002, plus approval process. (Note: evaluation programme against 2002 functional requirements ceased in 2006.)

Russell, E. (2005) 'The National Archives approved electronic records management systems: top 10 questions', Records Management Bulletin, (125), pp. 25-28.

***734 2005 HLL**

“Clinical Accounting InforMation (CLAIM) is a standard [ST] for the exchange of data between patient accounting systems and electronic medical record (EMR) systems. It uses eXtensible Markup Language (XML) as a meta-language and was developed in Japan. CLAIM is subordinate to the Medical Markup Language (MML) standard, which allows the exchange of medical data between different medical institutions. Article describes the creation of a localized Chinese version based on CLAIM.

Guo, J., Takada, A., Niu, T., He, M., Tanaka, K., Sato, J., Suzuki, M., Takahashi, K., Daimon, H., Suzuki, T., Nakashima, Y., Araki, K. & Yoshihara, H. (2005) 'Enhancement of CLAIM (Clinical Accounting InforMation) for a localized Chinese version', Journal of Medical Systems, 29 (5), pp. 463-471.

£812 2005 MHM

Explains the AdsML standard “an XML-based business that facilitates business and technical cooperation in the so-called advertising supply chain. Technically, it is a data exchange mechanism that supports ‘trading partners’ as they swap data throughout the ‘advertising and advertisement’ life cycle across all media.”

Christopher, L. C. (2005) 'The Long Road from Concept to Implementation', Seybold Report: Analyzing Publishing Technologies, 5 (9), pp. 5-11.

£740 2006 MMM

Organizations procuring ERMS want assistance. Requirements for ERMS, basis for formal testing and approval of software products. The National archives (TNA) scheme 2002-2005. MoReq (Model requirements for the management of electronic records) (EU) - no testing regime. MoReq2 - expected 2008.

Whiting, J. (2006) 'Beyond 2002: life after TNA testing', Records Management Bulletin, (134), pp. 15-16.

£664 2006 MLL

The National Archives (TNA) (UK) discussing producing Rationale documentation to place TNA's ERMS requirements into context. (Note: evaluation programme against 2002 functional requirements ceased in 2006.)

Blake, R. (2006) 'Interpreting electronic record management requirements: the development of formal rationales', Records Management Bulletin, (130), pp. 21-22.

***1336 2007 HHM**

Research into p.135 “whether the way RM professionals manage records in accordance with the ISO 15489 standard is consistent with the information seeking behaviour (ISB) of Electronic Records Management Systems (ERMS) users.” Forty ERMS users (middle managers in four Australian government organizations) participated in the research through questionnaires, interviews and protocol analysis.

Singh, P., Klobas, J. E. & Anderson, K. (2007) 'Information Seeking Behaviour of Electronic Records Management Systems (ERMS) Users: Implications for Records Management Practices', Human IT, 9 (1), pp. 135-181.

4. DEVELOPING ERM PRINCIPLES AND PROCESSES

Covers:

Research, ideas and views; models from related fields

4.1. Research, Ideas and Views

Key issues arising from the literature:

Important research projects from America and Canada include:

The University of British Columbia project (UBC) (followed up by / influenced later projects such as: US Department of Defense (DoD); InterPARES);

The University of Pittsburgh project (Pitt Project) (followed up by / influenced later projects such as: 'Models for Action' (MfA) project, a partnership between the Center for Technology in Government (CTG) at the State University of New York (SUNY) and the New York State Archives and Records Administration (NYSARA); the Philadelphia Electronic Records Project (PERP) based on the City of Philadelphia; Business Acceptable Communications (BAC) Metadata project at the University of Pittsburgh; Indiana University electronic records project)

InterPARES project: theoretical foundation of project is diplomatics, archival science and law; examining the basic concepts of the record, the electronic record, reliability, authenticity and authentication.

Comparison between UBC and the Pitt Project:

UBC: using concepts and methods of archival science and diplomatics; life cycle model; looking for methods to ensure the reliability and authenticity of e-records; life cycle model; use of registry model applied to e-records

Pitt Project: theoretical grounding - David Bearman; continuum model; e-records defined as evidence of transactions, but '*respect des fonds*', provenance and warrant still apply; produced functional requirements for RK systems; metadata specifications.

Work and ideas from Australia:

Development of strategy, policy and guidelines culminating in the ERM standard AS4390 (the precursor of ISO15489); concepts such as the continuum model, post-custodial theory; SPIRT metadata project

Other ideas / issues:

Record series; functional analysis; appraisal at the concept stage; convergence of records managers and archivists; end-users are the record keepers; hybrid systems; paperless office; 'unwrapped' content; automation of RM processes; automatic classification / categorisation

Debate:

Are traditional RM principles and processes applicable in the e-environment? These quotes / paraphrases illustrate this: change in the form, but not the principles and processes; Traditional definitions and concepts can accommodate the e-world. "Electronic records generate different challenges of identification, access, retention and storage. However, intellectual control, the meta-process, remains the same"; "provide a translation of the traditional principles"; Ways in which this is achieved for e-records can be different to that of paper records. NARA has initiated projects aimed at changing rather than simply adapting RM practice to deal with new technologies.

Debate:

Gap between the researchers, theorists and the practitioners. These quotes / paraphrases illustrate this: "divergence between theory and practice"; "Practical implementation of any solid advice that comes from the numerous studies on electronic

records is what is needed”; “the main theorists of the day are arguing among themselves and advocating differing solutions to basically the one and the same problem.” ERM research projects have not examined extent to which records users / creators / managers understand project outcomes and definitions, or how understanding actually maps to practice and perceptions. Concepts and language used not only differ between disciplines, but also fail to coincide with those of project theoreticians. Items below are arranged in chronological order to show historical developments.

£#656 1996 HMM

Discussion of e-records issues and examination of **post-custodial ideas** and strategies, with case examples. CONCLUDES that “archival institutions alone cannot preserve electronic records of value. Where records are does not matter so long as they are appropriately created and the valuable are preserved (as authentic evidence of transactions) and remain accessible and the rest are appropriately destroyed when they cease to have administrative value” (p302). (O'Shea & Roberts, 1996)

O'Shea, G. & Roberts, D. (1996) *'Living in a digital world: recognising the electronic and post-custodial realities'*, *Archives and Manuscripts*, 24 (2), pp. 286-311.

£720 1996 HML critiqued by 1106

One view of ERM. US RM came about to deal with huge volume of government paper records arising from WWII. Approach moved attention from documents to **record series**. RM involved management over three phases: creation, maintenance, disposition. E-records - **change in the form, but not the principles and processes**; records managers need re-education and new professional relationships.

Menkus, B. (1996) *'Defining electronic records management'*, *Records Management Quarterly*, 30 (1), pp. 38-42.

£1106 1996 HML critique of 720

Disagrees with 720. 1990s has seen broad new developments in the archival profession. Stress on defining record; articulating its characteristics through systems / software design tools; warrant based on social, legal, best practice and professional bases. Pittsburgh Project has been central, although there have been other projects such as UBC. **New ideas about ERM, e.g. post-custodial approach, records as evidence**. Continuing value of records for evidence, accountability, and memory purposes.

Cox, D. R. J. (1996) *'Re-defining electronic records management'*, *Records Management Quarterly*, 30 (4), p. 8.

£722 1996 HMM

State of ERM at time. Critical review of 5 key documents on major ERM initiatives 95/96. (i) **Australian National Archives** Common position statement on ERM. (ii) **University of Pittsburgh** Project on Functional Requirements for Evidence of Recordkeeping. (iii) **Australian State and Commonwealth policies, guidelines**. (iv) **SESAM** (Swedish National Archives and Astra AB): Philosophy & Rules concerning Electronic Archives and Authenticity. (v) National Archives and Records Administration (US) (**NARA**) RM requirements for electronic recordkeeping.

Bearman, D. (1996) *'State of electronic records management worldwide: Spring 1996'*, *Archives and Museum Informatics*, 10 (1), pp. 3-40.

£463 1997 MLM

State of play with ERM at time. Defining functional requirements, e.g. research at **University of Pittsburgh and University of British Columbia**.

Cox, R. J. (1997) *'Electronic systems and records management in the information age: an introduction'*, *Bulletin of the American Society for Information Science*, 23 (5), pp. 7-9.

***467 1997 MHM**

Integrating RK requirements at the systems design stage of ERMS. The '**Models for Action' (MfA) project**, a partnership between the Center for Technology in Government (CTG) at the State University of New York (SUNY) and the New York State Archives and Records Administration (NYSARA). **Influenced by University of Pittsburgh**. Development of tools / products, e.g. Records Requirements Elicitation Component (RREC), integrates with business process analysis, e.g. the Records Requirements Implementation Component (RRIC) centred on technology, management, and policy. **MfA products being tested at the NY State Adirondack Park Agency**.

Kowlowitz, A. & Kelly, K. (1997) 'Models for action: developing practical approaches to electronic records management and preservation', Bulletin of the American Society for Information Science, 23 (5), pp. 20-24.

£*160 1998 HMM

US initiatives on ERM and digital preservation, including: **University of Pittsburgh** functional requirements and metadata development. **City of Philadelphia project to test Pittsburgh** specifications in real-life implementation and develop comprehensive RM policies. **Indiana University** development of assessment tool and methodology for analyzing ERMS, **using Pittsburgh model**. Center for Technology in Government at the State University of New York (**SUNY-Albany**) project to identify best practices for ERK **based on work for Pittsburgh, University of British Columbia and Department of Defense, plus co-operative pilot project with Adirondacks Parks Agency**.

Ray, J. M. (1998) 'Search for tomorrow: the electronic records research program of the U. S. National Historical Publications and Records Commission', Journal of Government Information, 25 (4), pp. 367-373.

£146 1997 HHH

Identifies challenge of specifying metadata for e-records: **revisit the principles / methods used with paper records**; integrate metadata capture with the processes of capturing e-records; rethink appraisal - timing of. Compares 3 metadata models **UBC (University of British Columbia), Bearman's BAC (Business Acceptable Communications) based on University of Pittsburgh & AS4390 Pt 4**.

Reed, B. (1997b) 'Metadata: core record or core business?', Archives and Manuscripts, 25 (2), pp. 218-241.

£*164 1997 HMH

Evaluation & comparison of two important ERM research projects – **University of British Columbia**, School of Library, Archives and Information Science (UBC) and **University of Pittsburgh**, School of Information Studies. Ended up with two different models based on different underpinning theories and concepts. **UBC**: Purpose "to define the methods for ensuring reliability and authenticity of electronic records on the basis of **diplomatic and archival concepts and principles**" p.159. Life cycle model. Solution = registry model applied to e-records. "The careful construction of the triad of complete, reliable, and authentic is forcefully translated to the electronic records context." p.167. Integration of business and documentary procedures. Places record-keeping framework strategically so it can accommodate institutional change. Involves centralization. **Pittsburgh**: e-documents: = consistently structured **records of transactions**. Purpose "to explicitly define what requirements must be met by record-keeping systems so that they [archivists] can intervene in organizational policy, systems design and program implementation to ensure the creation of records, preserve their integrity and provide for access" p.159. **Continuum model**. Theoretical grounding for Pittsburgh Project = David Bearman. Concept of e-record = '**respect des fonds**' and **provenance still apply**. More focus on issue of evidence of transaction rather than information, therefore more on context of creation and structure not just content. Product of business function / activity. BOTH: "Neither represents a 'grand

unified theory' for electronic record-keeping systems, but rather ideal solutions for different organizational contexts." p.171. OTHER work: **Australia** (based on Pittsburgh ideas) 'Policy on managing electronic messages as records' and 'Guidelines on managing electronic messages as records'. Pilot project at **City of Philadelphia using Pittsburgh** functional requirements.

Marsden, P. (1997) *'When is the future? Comparative notes on the electronic record-keeping projects of the University of Pittsburgh and the University of British Columbia'*, *Archivaria*, (43), pp. 158-173.

*464 1997 MHL

The **University of Pittsburgh project** took the view that the network of laws, standards, practice, and so on could add weight to the case for functional requirements by providing a **warrant** for organisational compliance with the functional requirements. As part of the project, a compendium of laws etc was compiled, initially concentrating on legal, auditing, and IT sources as practitioners in these areas have power within organizations. Three experts in each field were consulted in compiling the sources. Some functional requirements were heavily supported by the sources but some far less so. A surprising result was that some legislation aimed specifically at electronic records management did not help much in providing warrant for the functional requirements. Subsequent study found that citation of warrant had a significant impact on acceptance of functional requirements ERKS.

Duff, W. M. (1997) *'Compiling warrant in support of the functional requirements for recordkeeping'*, *Bulletin of the American Society for Information Science*, 23 (5), pp. 12-13.

*466 1997 MML

Using **Pittsburgh Project** functional requirements to demonstrate possibility of incorporating RM functionality in two pilot implementations. Prospective rather than actual implementation, sets out how the model / system will be tested and implemented. In 1991 the **City of Philadelphia** was undergoing significant IT systems design. Because of the vastness of the overall project, the RM project concentrated on "intervening in the redesign of specific, small- and medium-sized transactional information technology systems" [p17]. The 'record-description-record' (RDR) approach stemming from the Pittsburgh Project has three elements: (1) define the contextual information needed; (2) obtain or create that information; (3) bind it to the content in a data structure. The Philadelphia ER project (PERP) has gone with the RDR approach to allow for delivery of a functioning prototype within the funding timescale for the purpose of demonstrating ease of incorporating RK functionality at systems design stage. Focus is on two test-case systems, one an HR information system, the other an adjudication tracking system.

Giguere, M. D. (1997) *'Automating electronic records management in a transactional environment: the Philadelphia Story'*, *Bulletin of the American Society for Information Science*, 23 (5), pp. 17-19.

#313 1997 MMM

World Bank. P.25 "evolution of an electronic document management system that includes recordkeeping components and how the **University of Pittsburgh requirements were used to evaluate** it at one crucial point in its development." For document imaging adopted Electronic Filing System (EFS) from Excalibur Technologies. Assessed the EFS set up against the Pittsburgh functional requirements. P.28 "The Pittsburgh study recommended four tactics for meeting requirements: policies, design, implementation and standards. The bank concluded that all are necessary and also placed a high degree of stress on training." The bank's e-system met most of the Pittsburgh requirements either wholly or partially. Now adopting Lotus Notes for email system.

Smith, C. D. (1997) *'Implementation of imaging technology for recordkeeping at the World Bank'*, *Bulletin of the American Society for Information Science*, 23 (5), pp. 25-29.

£727 1997 HMH

Situation 10 years ago, i.e. 1987. Many people including records managers had no access to a personal computer or to email. Therefore IT people were setting the ERM agenda. Change from this scenario very rapid, e.g. development of global community and communication tools, rapid cycle of development of IT tools, personal computers became ubiquitous in the workplace. These rapid changes left records managers behind in their attempts to develop ERM. Now in 1997: nearly all documents in industrialised countries are created electronically, and developing countries are catching up. Records managers tend to argue against new technologies and the risks they pose to RM rather than finding ways to work with them. P.165 "the lesson of North America is that organizations will introduce new technologies when they see a business advantage to do so, or a lost advantage for not doing so, whether or not records managers are ready." ERM research has taken great strides in the last 10 years. Considerable progress in ERM policies and guidelines, particularly in Australia. Records managers have become computer literate, so they are now aware of the issues and the technology personally. However, records managers are better at articulating the questions for ERM rather than giving answers. But now have reasonable agreement on the definition of an e-record. We have made good progress in developing the functional requirements for EDMS, however not so good at the next step of practical implementation of a system. True ERMS are now emerging. Making progress in developing international standards. The challenges we face include: p.173-176 "Getting on with practical implementation of electronic records systems"; "Doing a better job in R&D"; "Extending policy development activities in most countries"; "Stepping up activity to further the establishment of ISO standards for ARM"; "Paying more attention to changing work patterns and understanding and anticipating what those changes mean for the practice of archives and records management"; "Working with other disciplines in tackling what are on the one hand opportunities afforded by new technology that on the other may present serious issues to overcome". Many challenges ahead but main one is p.177-8: "the raison d'être of recordkeepers and the added value of recordkeeping" when much of the current RM tasks will be automated?

Barry, R. E. (1997) 'Electronic records management...the way we were...the way we are: one man's opinion', Records Management Journal, 7 (3), pp. 157-189.

£728 1997 HMH

Australia's approach to ERM in the 1990s. Prior to 1990s recordkeepers had not addressed e-records. Even though IT might have been used to create documents 'official' records were paper. REINVENTING RECORDS MANAGEMENT. Development of the records **continuum approach**. Leading to **AS 4390**, the RM standard. In 1996 the Kirribilli Statement p.194 "by the year 2000 all Australian organisations will follow guidelines and standards for the management of electronic records which are based on common principles, concepts and criteria." WORKPLACE REALITIES. P.197 "While the packages are now offering increased capacity to manage electronic documents, the majority of organisations are wary of the solutions proposed and have not yet integrated the electronic and paper worlds." Technological changes happening at an incredible rate. Computers on every desk, use of email, organisations interested in information dissemination and sharing. Working practices into smaller groups and teams not rigid bureaucracies. EDMS and workflow software. Intranets and extranets. Electronic commerce, electronic data interchange, document interchange. Information infrastructure being addressed at government level. RM often thought as relevant only to the paper world. Packages sold as addressing p.197 "all the information needs of organisations without the need for records management." Recordkeepers fighting to be heard. Trying to integrate different packages to address RM requirements. Traditional records management packages are document management packages. Some strategic approaches, e.g. government specification for RM software. ARCHIVES AND ELECTRONIC RECORDS. Government archives involved in the strategic

direction of electronic recordkeeping. Leading Australian archival institutions have adopted a policy of **distributed custody** for e-records.

Reed, B. (1997a) 'Electronic records management in Australia', *Records Management Journal*, 7 (3), pp. 191-204.

*621 1998 HHH

University of Pittsburgh research: **redefinition of e-record – evidential**; functional requirements for e-recordkeeping; metadata specifications. **Indiana University** Electronic Records Project (IU) **applied the Pittsburgh ideas**: approach successful and superior to standard RM methodology; identification of records; identification of the universe of records necessary to document a business function; identification of how records are created; identification of the documentation needed to adequately describe the event; overall management of records; functional requirements; metadata requirements. IU defined a methodology to implement Pittsburgh: functional analysis; identification of transactions; review of existing records systems; evaluation of system; recommendation relating to system improvements.

Bantin, P. C. (1998) 'Developing a strategy for managing electronic records: the findings of the Indiana University Electronic Records Project', *American Archivist*, 61 (2), pp. 328-364.

£620 1998 HHH

E-records managed by traditional concepts versus the need for a new paradigm to handle e-records. **New ideas: New definitions of e-records emphasise the role of evidence** of a business transaction and ignore information value. **Records continuum to replace the lifecycle**. The **distinction between archivists and records managers to be dissolved**. **Appraisal to occur at the concept stage**, covering function not content.

Henry, L. J. (1998) 'Schellenberg in cyberspace', *American Archivist*, 61 (2), pp. 309-327.

£715 1998 HLL

Developments in UK, US, Canada, Australia. Electronic records, unlike paper records, need to be strategically managed to ensure preservation. Different methodology needed for appraising ERs. Development of continuum model as alternative to life-cycle. Post-custodialism.

McInnes, S. (1998) 'Electronic records: the new archival frontier?', *Journal of the Society of Archivists*, 19 (2), pp. 211-220.

£*718 1998 MMM

Debate on theories of e-records. Contrast between the **University of British Columbia** project (UBC-MAS) and the **University of Pittsburgh** Project. Pittsburgh project, followed up by: the Philadelphia Electronic Records Project (PERP) based on the **City of Philadelphia**; **Business Acceptable Communications (BAC) Metadata** project at University of Pittsburgh; **Indiana University** electronic records project. **UBC followed up with work with the US Department of Defense** records management Task Force. Pittsburgh: p.20 "thirteen functional requirements are needed to ensure the preservation of evidence in electronic form. Although specifically related to electronic record-keeping systems, they are also applicable to manual or hybrid systems. ... [these] requirements could be met by one of the four following strategies: * design * policy * implementation and * standards." **UBC used concepts and methods of archival science and diplomatics**. Defined reliability and authenticity. Created 8 templates that p.23 "identify the necessary and sufficient components of records in both traditional and electronic record-keeping environments." Gap between the researchers, theorists and the practitioners. P.26 "This divergence between theory and practice reflects an interesting phenomenon - how such an idea can continue to have such currency when most archivists faced with fiscal and administration constraints have ignored this approach out of practical reality." p.26 "Working with both paper and electronic records will be with a lot of

archivists and records managers for quite some time." p.26 "Practical implementation of any solid advice that comes from the numerous studies on electronic records is what is needed. Grappling with theoretical concepts while also dealing with staff cut-backs and dwindling resources ... is not an easy task. It is not made easier when the main theorists of the day are arguing among themselves and advocating differing solutions to basically the one and the same problem."

Adami, T. A. (1998) 'The 1990s archival war of the roses', *Records Management Bulletin*, (89), pp. 19-26.

£597 1998 MMM

10 'megashifts' that are occurring in RM in the 1990s and beyond.

Stephens, D. O. (1998) 'Megatrends in records management', *Records Management Bulletin*, (86), pp. 3-9.

£1335 1998 HML

Electronic patient record (EPR). P.285 "the EPR Programme of the NHS Executive reasoned that if the clinical process was supported with IM&T, i.e. computer-based systems developed specifically to support clinicians, then the records would be automatically produced as a by-product of that support. The **EPR is not computerizing the paper medical or clinical record as it currently exists, but is supporting the clinical process**, with the record being automatically produced." Envisage two types of EPR: the active EPR generating real-time information at the point of health care delivery, and the historical electronic health record (EHR) summarising the care. Presents model for active EPR in acute trusts. Need a model for how the active EPR can generate summaries of clinical data for the EHR which can be accessible to all clinicians, via NHS-net, and provide the cradle to grave record.

Brennan, S. (1998) 'Supporting Clinical Care with Electronic Patient Records', *Health Libraries Review*, 15 (4), pp. 280-282.

£123 1999 MMM

About move to paperless environment and implications / impact for records managers. Use of the ladder model in RM from low (i.e. paper) to high (i.e. e-records) levels of sophistication. Authors argue this model should be replaced by a bush model, with many branches but none 'higher' than any other.

Kreger, L. (1999) 'Paper and the information age', *Information Management Journal*, 33 (4), pp. 38, 40-32.

£442 1999 HMM

Electronic records should be managed by **using the same principles and procedures** used to manage traditional paper records. Three principles in particular: (1) All records are owned by the organization; (2) only necessary records should be filed, and these should be subject to appropriate disposal; (3) records need to be organized logically.

Sanders, R. L. (1999) 'Personal business records in an electronic environment', *Information Management Journal*, 33 (4), pp. 60-63.

£*218 1999 HHH

Description of two projects: **University British Columbia / Department of Defense** 'Preservation of the Integrity of Electronic Records'; **UBC within InterPARES**.

Duranti, L. (1999) 'Concepts and principles for the management of electronic records: or records management theory is archival diplomatics', *Records Management Journal*, 9 (3), pp. 153-175.

£603 2000 HMM

Collaborative research initiatives in **Australia** in mid-late 1990s viz. national policies & standards (AS4390, 1996, ACA's Common Framework for Electronic Recordkeeping, 1996; Records & Archives Competency Standards, 1997; Documenting the Future: Policy and

Strategy for Electronic Recordkeeping in the New South Wales Public Sector, 1995; Managing Electronic Records: a shared responsibility, 1995; Keeping Electronic Records, 1995; plus many NSW guidelines & NAA standards / policies); **SPIRT metadata project** 1998-99; **VERS project** 1998-99; **Monash University's Enterprise Information Research Group** (EIRG) to bring researchers & industry together; & (on a larger scale) Australian Government's DSTC (**Distributed Systems Technology Centre**) as an umbrella for research into technical infrastructure for "enterprises of the future" (p365). Initial work has been to develop policies and standards to provide a framework for individual organizations, also to encourage education and research programmes "including research and development in the recordkeeping community".

McKemmish, S. (2000) 'Collaborative research models: a review of Australian initiatives', *American Archivist*, 63 (2), pp. 353-367.

£259 2000 MMM

Thoughts on **hybrid** record systems. **Traditional definitions and concepts can accommodate the e-world.** p. 18 "All records, paper and electronic, should be viewed, evaluated, appraised, searched, maintained through their metadata." Easier for electronic than paper. A logical file that brings together both electronic and paper records is difficult to use. Solutions (both with problems) are (i) print out all e-records, (ii) scan all paper records.

Horsman, P. (2000) 'Through the looking glass: the intelligent management of hybrid record systems', *Records Management Bulletin*, (97), pp. 13-18.

£700 2000 HMM

Electronic records retention: fourteen basic principles. "**provide a translation of the traditional principles** associated with records retention from visible media to electronic recordkeeping environments".

Stephens, D. O. (2000) 'Electronic records retention: fourteen basic principles', *Information Management Journal*, 34 (4), p. 38+ (11 pages).

£703 2000 HMM

Discussion of problems caused by resistance to change and lack of ERM skills among records professionals. Very few interesting ERM projects, and most of these draw on **Pittsburgh University / University British Columbia** (UBC) projects; may be too little, too late, or not used by records professionals. Praiseworthy examples are **CTG (SUNY) Models for Action** project and **Indiana University** project, which **took Pittsburgh functional requirements as starting point** and approached records needs by testing and modifying these and other assumptions and highlighting needs for further work. This type of project needs to become the norm, but only twenty or so are being carried out worldwide while most archivists ignore ERM or hope that one of the projects will provide the 'magic bullet'.

InterPARES may have an impact on national archives, but these are very different from archives at corporate and local levels.

Cox, R. J. (2000) 'Searching for authority: archivists and electronic records in the new world at the fin-de-siecle', *First Monday*, 5 (1).

£127 2000 MMM

Looking back over the 100 issues of the RMS bulletin - RMS started in 1983. P.3 "Electronic mail and the Internet have radically changed the working environment, although the extent to which this has happened can be over-emphasised." p.5 "... there is an obsession with electronic records as such, which fails to recognise that they still do the same things as their paper equivalents." p.5 "**Electronic records generate different challenges of identification, access, retention and storage. However, intellectual control, the meta-process, remains the same** and the key is in the phrase record-keeping system." P.9. "The primary problem with technology is that it is seen as a sort of philosopher's stone of records management. ... [managers] ignore the need to plan and manage records because 'technology will take care of the problem'. The cause of sound records management - and of

the technology too, ultimately, because the implementation of RM might make it work - has been set back by the thoughtless repetition of the electronic mantra."

Emmerson, P. (2000) 'And yet...records management then, now and next?: a personal reflection', Records Management Bulletin, (100), pp. 3, 5-7, 9-10.

***206 2001 HHH**

Indiana University (IU) Electronic Records Projects: lessons learnt. (i) The primary data and information systems employed by most institutions are poor recordkeeping systems, e.g. transaction processing systems which do not routinely and systematically capture records; database management systems which are dynamic, volatile systems so context is lost, also lack required metadata and record structure documentation. (ii) Traditional records management strategies established for paper records need to be altered in significant ways to accommodate electronic, e.g. records continuum is a better model; create and employing conceptual models designed to analyse and document record-keeping systems.

Bantin, P. C. (2001) 'The Indiana University Electronic Records project: lessons learned', Information Management Journal, 35 (1), pp. 16, 18-20, 22-14.

£*678 2001 HHL

Coverage of ERM research. Definition of an e-record in the two research projects **University British Columbia** (UBC-MAS) & **InterPARES**. UBC-MAS defined the necessary and sufficient components of an e-record to be medium, content, form, action, persons, archival bond, context. **Ways in which this is achieved for e-records can be different to that of paper records.** Need additional requirements such as compilation, authentication, access privileges, workflow rules, secure access, audit trails. p.274 "At this time, there is no international consensus on the methods for protecting the integrity of the electronic records that must be preserved indefinitely or even permanently ... and for enabling the verification of their authenticity over time." Issue being addressed by InterPARES project. Using work from UBC-MAS project on concepts of authenticity and reliability and definitions of records and e-records. InterPARES comprises four domains. P.25 "The first domain aims to identify the requirements or preserving authentic electronic records. The second domain aims to establish whether, in order to satisfy the requirements for authenticity identified in domain one, the selection criteria and methods for electronic records need to be revised or even radically changed. The third domain aims to develop methods, procedures, and rules for the preservation of electronic records according to the requirements identified in domain one, and to define the responsibilities for implementing them. The fourth domain aims to develop a framework for the formulation of strategies, policies, and standards." InterPARES is an international multi-disciplinary project using a variety of methods, including surveys, case studies, diplomatic analysis and modelling. Preliminary findings are tested in archives and industry test sites across countries and across the public and private sectors.

Duranti, L. (2001) 'Concepts, principles, and methods for the management of electronic records', Information Society, 17 (4), pp. 271-279.

***693 2001 HMM**

Interim report on the **InterPARES project**. Theoretical foundation of project is diplomatics, archival science and law, examining the basic concepts of the record, the electronic record, reliability, authenticity and authentication. Four domains of study. Important concept to Domain I is the concept of the four functions of records. Work of the Authenticity Task Force p. 46 "(1) developing a template capable of guiding the analysis of electronic records, (2) carrying out such analysis through four rounds of case studies of electronic records and systems, and (3) establishing a typology, or classification, of electronic records base on authenticity requirements." Developing a typology, using the four record function categories. Aim is to develop preservation models.

Duranti, L. & Thibodeau, K. (2001) 'The InterPARES international research project', Information Management Journal, 35 (1), pp. 44-46, 48-50.

£*139 2001 MMM

Three aspects of the virtual world of digital information: (1) the record becomes "intangible and volatile" p.11. (2) "blurring of boundaries" p.11. Boundaries become logical rather than physical. Globalisation. (3) "narrowing of our outlook or perception of time" p.12. What does this mean for RM? "(1) The shift of focus to the intellectual record. (2) The paradigm of one virtual world. (3) The integration of record-keeping into that world, especially into business processes." p.13. "The issue is to define a path from the current, still mainly paper-based, situation towards a future where record-keeping is integrated into digital business processes." p.14. Description of reference model developed by the **Digital Longevity program in the Netherlands**.

Hofman, H. (2001) 'A road map to the future, and proper record-keeping in a digital environment', Records Management Bulletin, (102), pp. 10-18.

£*224 2001 HHH

Various perspectives on evidentiary problems presented by electronic records – archival, legal, technical, social. ERM research projects have not examined extent to which records users / creators / managers understand project outcomes and definitions, or how understanding actually maps to practice and perceptions. Article examines practitioner terminology in relation to authenticity with aim of using this to build framework to assist in mapping correspondences between theoretical constructs and actual language / constructs. Reports on pilot study based on questionnaire survey on how different communities use and understand concept of authenticity in recordkeeping, which will provide basis for further development of research topic. Findings: concepts and language used not only differ between disciplines, but also fail to coincide with those of project theoreticians – practitioners see authenticity in terms of accuracy, originality and verification rather than evidence, warrant, auditability etc.

Park, E. G. (2001) 'Understanding 'authenticity' in records and information management: analyzing practitioner constructs', American Archivist, 64 (2), pp. 270-291.

£*782 2001 HML

Brief overview of research in field of ERMS.

Zanish-Belcher, T., Christian, M. & Daly, C. (2001) 'The age of the electronic document: the documenting challenge for academic archives', Collection Management, 26 (2), pp. 43-56.

£140 2001 MML

Brief overview of ERM. Drivers = e-government agenda, laws such as FoI, DP, public expectation of instant access. So emphasis is now electronic delivery of services. A new information landscape created by the Internet. So RM needs to be conducted within an integrated electronic environment. E-gov standards, Public Records Office (PRO) guidance on ERM. Need to ensure that e-records are managed as a corporate resource.

Honer, E. (2001) 'Information management: hub or spoke?', Records Management Bulletin, (103), pp. 3-5, 7.

£413 2001 HMM

Archival profession challenges, e.g. e-records; wide range of non-textual records, e.g. audio visual; new types of records – geospatial data; methods for user access; global nature of records.

Hickerson, H. T. (2001) 'Ten challenges for the archival profession', American Archivist, 64 (1), pp. 6-16.

£759 2001 MML

Beginner's guide to managing e-records. E-recordkeeping should be integrated with business processes. Need for purpose-written procedures and guidelines for ERM

throughout the records life cycle. Essential that users understand their responsibilities for identifying e-records. Possibility for some automation of stages within ERM, e.g. registration, classification. Problems of disposal of e-records.

Wilson, J. (2001) 'Records management information: A guide to managing electronic records', Records Management Bulletin, (101), p. Suppt 4pp.

£580 2001 MMM

Need for EDMS to incorporate RM principles and features. P.10 "Many EDM systems have poor RM functions."

Allison, D. (2001) 'The application of records management disciplines into electronic data management', Records Management Bulletin, (103), pp. 9-11, 13.

£216 2001 HMM

Technologies and business models for clinical data management. Changes in 1980s with introduction of computers, but little changed since then. Now clinical data management organisations are in transition, with some looking to adopt new technologies and workflow techniques whilst others are making their existing systems more efficient. The 2010 business environment will be different, with the effect of factors such as: inter-company partnerships on R&D; economics requiring the timely stopping of low-value products; tailored drugs and therefore a number of different protocols and programmes for the same product; competition for development rights and need for competitively advantageous development processes; expectations of immediate access to information raised by the impact of the Internet; use of IT by regulatory agencies; non-textual data, e.g. images videos, as part of the clinical record; growing assertiveness of investigative sites and patients and increased concerns over privacy. Discussion of approach for choosing an IT system.

Waife, R. S. (2001) 'Transitioning clinical data management from the 1980s to the 2010s: strategies for corporate decision making', Drug Information Journal, 35 (3), pp. 713-719.

£697 2002 MMH

Chinese context. Recommends p.28 "records **continuum model** as a best practice model for managing electronic records and archives within a broader context of archival science." Model comprises: an integrated framework (Common culture. Common standards. Information sharing. Co-ordination. Collaboration); an integrated approach (Client-led marketing strategy. Post-modern archival thinking. Records continuum regime); an integrated control (Product-control. Process-control. Service-control). P.34 "Such a collaborative methodology is interdisciplinary, it views the record-keeping as crossing the borders of document management, records management and archives management. It believes that the accountability of record-keeping lies across organisations and the roles of creators, users, administrators and custodians under the same umbrella of an integrated framework throughout the life of a record."

An, X. (2002) 'The Chinese view of records continuum methodology and implications for managing electronic records', Records Management Bulletin, (108), pp. 28-35.

£#393 2002 MMH

Hybrid RM, discussion with reference to approach at Westminster City Council.

Howard, S. (2002) 'Hybrid records management: a local government perspective', Records Management Bulletin, (110), pp. 3-7, 18.

***584 2002 MMM**

A **model** defining the relationships between RM, EDM (electronic document management) and KM (knowledge management).

Winterman, V. (2002) 'An uncommon trinity: a brief outline of the relationships between records management (RM), electronic document management (EDM) and knowledge management (KM)', Records Management Bulletin, (106), pp. 5, 7-10.

***680 2002 HHL**

Survey of electronic patient record (EPR) adoption in US healthcare organisations. Questionnaire survey conducted in 1999, backed up with published documents and statistics. P.366 "Despite a decade-long call for the implementation of EPRs, most healthcare organizations have not yet adopted a fully computerized record system. ... organizational adoption of EPRs is far from universal, and presents significant barriers to the ultimate goal of seamless electronic transfer of information across disparate adopters."

Lorence, D. P., Spink, A. & Richards, M. C. (2002) 'EPR Adoption and Dual Record Maintenance in the U.S.: Assessing Variation in Medical Systems Infrastructure', Journal of Medical Systems, 26 (5), pp. 357-367.

#166 2002 HMM

US Department of Education. Pilot use of **neural network technology to analyse and categorise** electronic materials.

Schewe, D. B. (2002) 'Classifying electronic documents: a new paradigm', Information Management Journal, 36 (2), pp. 54, 56-59.

£247 2003 HML

Application of **Australian Series system** (archival control system or metadata system) to e-records.

Feldman, P. (2003) 'Applying the Australian Series system to the management of current records', Records Management Journal, 13 (2), pp. 54-61.

£297 2003 HMM

EDMS. **Automated indexing** for retrieval of records, with no structured records system being required is inadequate. User addition of metadata is expensive and inaccurate. Solution is a directory structure (with a hierarchical representation of functions, activities, processes, projects, record series etc.) embedded within the metadata. Full **functional analysis** of the organisation and production of a classification scheme is a key component of ERM.

Moss, M. & Tough, A. (2003) 'Metadata, controlled vocabulary and directories: electronic document management and standards for records management', Records Management Journal, 13 (1), pp. 24-31.

£435 2003 MMM

Drawing on the literature, a reworked MSc assignment. **Who should 'guard' e-records?** The professional expert, e.g. archivists, or record creators / users?

Chapman, A. (2003) 'From obelisk to optical disc: confronting the custody conundrum', Records Management Bulletin, (116), pp. 3-8, 46-50.

£587 2003 MMM

Technology has raised the profile of RM for e-records. Drivers in financial services are stricter compliance regulations because of scandals. Drivers in public sector are for better RM inside the e-gov agenda. Vendors of IT solutions are taking advantage of this. But need to distinguish between a record (and therefore an ERMS) and a document (and therefore an EDMS).

Higgison, S. (2003) 'Electronic document and records management', Records Management Bulletin, (116), pp. 17-20.

***165 2003 HMM**

Use of **XML** schemata accessed via a relational database to integrate elements using different metadata systems into a single flexible repository / catalogue. Proposal for use of multi-XML schemata following XML standards to overcome weakness of object-oriented languages for information sharing and maintenance of relationships between class and

entity.

Chen, R.-S., Lu, K.-Y. & Yu, S.-C. (2003) 'Metadata management system: design and implementation', *Electronic Library*, 21 (2), pp. 154-164.

£254 2004 MLL

JISC is developing a RM InfoKit providing guidance for the HE and FE sectors. Also an EDRM implementation Toolkit.

Bailey, S. (2004) 'Records management development tools in the FE and HE sectors', *Records Management Bulletin*, (120), pp. 11-12.

*67 2004 HMM

Automatic document classification techniques.

Calvo, R. A., Lee, J.-M. & Li, X. (2004) 'Managing content with automatic document classification', *Journal of Digital Information*, 5 (2), p. No page numbers.

£*59 2005 HMM

Reorientation of diplomatics to enable ERM. Need an overall approach that takes into account multiple levels: diplomatics at the individual record level; archival science at the record aggregate; systems analysis at the ERMS level.

Williams, C. (2005) 'Diplomatic attitudes: from Mabillon to metadata', *Journal of the Society of Archivists*, 26 (1), pp. 1-24.

\$520 2005 HLM

Work and programme of US National Archives and Records Administration (**NARA**) on ERM. Research includes: requirements analysis, e.g. involvement with **InterPARES**; development of requirements for **RM Service Components** (RMSC), i.e. software components affecting e-records creation and management, to allow inclusion of RM requirements early in processes and as integral part of agency enterprise architecture. Initiatives include the **Electronic Records Archive** (ERA), re-engineering RM, collaboration on the **Persistent Archive Testbed** (PAT). NARA has initiated projects aimed at **changing rather than simply adapting RM practice** to deal with new technologies.

Weinstein, A. (2005) 'NARA enters new "ERA" of electronic records management', *Information Management Journal*, 39 (5), pp. 22-24.

*158 2005 HHH

Work of **InterPARES 2** research project - Description Cross-Domain Group - on a metadata schema registry. Focus on need for an infrastructure to enable creation, preservation & accessibility of e-records metadata. P.43 "This registry is a prototype resource designed to assist archivists and records creators in multiple domains in developing and assessing their own and other communities' metadata infrastructures. The paper concludes by identifying two contested issues that are surfaced and how they are being confronted by this work: one of these is a definitional issue that relates to how to delineate the concept of archival description in the face of competing notions of "metadata." The other is the extent to which both the **life cycle and continuum worldviews** and associated activities can or should be supported, reconciled or even rethought through the conceptual and analytical approach that is embedded in the metadata schema registry."

Gilliland, A., Rouche, N., Lindberg, L. & Evans, J. (2005) 'Towards a 21st century metadata infrastructure supporting the creation, preservation and use of trustworthy records: developing the InterPARES 2 metadata schema registry', *Archival Science*, 5 (1), pp. 43-78.

#283 2005 HMM

Role of end-users in implementing enterprise-wide ERMS. 2 approaches: user guided to decide that item is a record and to place it in the file plan; make the **RM decisions automatically** in the background and transparent to users. Highest quality and accuracy

occurs when RM is as nonintrusive as possible to the desktop end user and does not interfere with their normal work routines.

Sprehe, J. T. & McClure, C. R. (2005) 'Lifting the burden', *Information Management Journal*, 39 (4), pp. 47-48, 50-52.

£750 2005 HMM

Electronic Health Record [EHR] architectures in the US and Australia: different models. Australia: summary of data from locally collected records extracted and aggregated into a centralized record for sharing. US: different initiatives at national, state and local level. Internet personal health record - data aggregated by patient who will then decide who to share it with.

Gunter, T. D. & Terry, N. P. (2005) 'The emergence of national electronic health record architectures in the United States and Australia: models, costs, and questions', *Journal of Medical Internet Research*, 7 (1), p. No page numbers.

£523 2006 HMM

French context. Over last 3–4 decades, **archivists have been aware of the need to get involved in managing information at an earlier stage**, and not just collecting it into archives at the end of its active use - particularly for e-records. No simple mapping of the English-language concept of 'record' to the French uses of 'document' and 'archive'. 'Records management' used in its English form has no exact equivalent. It has been suggested that 'records' corresponds to the French 'current' and 'intermediate archives'. However, 'records' implies process of selection from totality of documents that does not sit easily with French archival practice, particularly public sector, where selection does not take place in current and intermediate phases. Although involved with intermediate and accessioned archives, French public-sector archivists have little interaction with current records. But recognition that this needs to change. To facilitate this, a better understanding of 'records management' will have to be disseminated.

de Boisdeffre, M. (2006) 'The importance of records management in France', *Records Management Journal*, 16 (2), pp. 76-81.

£345 2006 HMM

p17 "a document both contains and acts as a cue to social 'rules' for its use ... [and] automating human behaviour where that behaviour is dependent on social 'rule', non-explicit and learned experientially, is difficult if not impossible." So what about e-documents? A document can be divided into parts: type, metadata, content, and these parts can be successfully automated. But the 'wrapping' has gone and p.16 "in its entirety the document acts as a 'wrapping' which contains social regulation and facilitates that document as a social artefact." p.18 "the complete document cannot be automated, i.e. replicated in an electronic version." But does it matter? P.18 "rules exist governing interaction with the computer ... These are the rules utilised and invoked by the electronic document. With the user expecting the old regulation [that of the document] but faced with the new [that of computer interaction], no wonder they can get confused!" This is why EDMS do not actually achieve what they say they are. So why not just deal with the content electronically. P.18 "content defines its metadata which defines its type" p.19 "'Unwrapped' content, then, might be a more successful way to electronically disseminate organisational communication."

Forbes-Pitt, K. (2006) 'A document for document's sake: A possible account for document system failures and a proposed way forward', *Records Management Journal*, 16 (1), pp. 13-20.

*868 2006 HHH

Document clustering technique for organising and providing access to information - an **automatic document-clustering** approach incorporates an individual's partial clustering as preferential information. Empirically evaluated the design, and demonstrated that using an individual's partial clustering can improve document-cluster effectiveness measured by

cluster recall and precision.

Wej, C.-P., Chiang, R. H. L. & Wu, C.-C. (2006) 'Accommodating Individual Preferences in the Categorization of Documents: A Personalized Clustering Approach', *Journal of Management Information Systems*, 23 (2), pp. 173-201.

*826 2007 HHM

E-document repositories for storage and sharing of documents using a document repository system based on **collaborative structuring**. System designed on top of open source system the Everything Engine. Tested design in repositories in large public universities with academics via click-stream analysis, online rating mechanisms, questionnaires, user interviews. P.88 "confirmed the feasibility as well as the benefits of collaborative structuring".

Wu, H. & Gordon, M. (2007) 'Collaborative Structuring: Organizing Document Repositories Effectively and Efficiently', *Communications of the ACM*, 50 (7), pp. 86-91.

4.2. Models from Related Fields

*449 2002 MHM

Designing an email records repository for the State of Texas using the **Open Archival Information System (OASIS) Reference Model**. The Texas Email Repository Model (TERM). A centralised repository for all Texas State agencies to share but also more functionally limited, short-term repositories within individual agencies.

Green, M., Soy, S., Gunn, S. & Galloway, P. (2002) 'Coming to TERM: designing the Texas Email Repository Model', *D-Lib Magazine*, 8 (9), p. No page numbers.

*510 2005 HHM

The use of **IM modelling and methodologies** in EDMS design to overcome shortcomings of technology-driven approaches. Proposed method uses **XML**-based information model, the Document Management and Sharing Model (DMSM), which aims to represent DM and business information through document metadata supported by Document Management and Sharing Markup Language (DMSML). Model designed and tested.

Paganelli, F. & Pettenati, M. C. (2005) 'A model-driven method for the design and deployment of Web-based document management systems', *Journal of Digital Information*, 6 (3).

*827 2007 HHH

A **content management model**, based on nonprofit organizations. The workflow process of creation, manipulation, and distribution of electronic documents in ECM systems is seen as a lifecycle: Stage 1: Content. Deciding what is and what is not content; Stage 2: Reification of content into searchable, usable information and workflows; Stage 3: Commodification or Process. Preparing the content for reuse.

Iverson, J. & Burkart, P. (2007) 'Managing electronic documents and work flows: Enterprise content management at work in nonprofit organizations', *Nonprofit Management & Leadership*, 17 (4), pp. 403-419.

*58 2005 HHM

Authors extended **Technology Acceptance Model (TAM)** the addition of Internet self-efficacy (ISE) to components of perceived ease of use (PEOU), perceived usefulness (PU), and behavioural intention (BI). Hypothesised that that ISE directly influences PEOU and PU, which in turn influence BI. Tested by questionnaire with healthcare support staff in a clinic using Web-based electronic medical records. Hypothesis supported. Results suggest that enhancing SE may be more effective option for technology acceptance than in enhancing usability / utility (which often requires much modification and thus harder to do). As SE a measure of belief / confidence rather than actual skills, susceptible to manipulation.

Liu, L. & Ma, Q. (2005) 'The role of Internet self-efficacy in the acceptance of Web-based electronic medical records', Journal of Organizational and End User Computing, 17 (1), pp. 38-57.

***265 2005 HHM**

Analysis of adoption of e-government services by business organisations in Singapore. Research comprised both development of a theoretical framework based on **Roger's Innovation Diffusion Theory** and by conducting a questionnaire survey with business organisations, Results of survey: p.434 "Perceived benefits, external pressure and social influence were found to be significant in terms of being related to the adoption decision [of e-government services], whilst management readiness and sensitivity to cost were found to be not significant."

Tung, L. L. & Rieck, O. (2005) 'Adoption of electronic government services among business organizations in Singapore', Journal of Strategic Information Systems, 14 (4), pp. 417-440.

5. LEGAL, BUSINESS AND SOCIAL ISSUES

Covers:

Data privacy and security; information access; legal aspects of e-records; preservation of e-records; risk and risk management.

5.1. Data Privacy and Security

Key issues arising from the literature:

Ensuring confidentiality, particularly of sensitive records such as health records.

£475 1996 HML

Discussion of approaches to security of electronic data interchange (EDI) in commercial world. EDI does complicate records retention practices, because systems tend to produce redundant and duplicate copies, and have no control of what a 3rd party transmitting / guaranteeing the data does. Approaches need to be tested in law.

Montana, J. (1996) 'Legal issues in EDI', Records Management Quarterly, 30 (3), pp. 39, 42, 44-35.

£1334 1998 HML

Confidentiality of patient records, with reference to e-record issues. British Medical Association (BMA) Information Technology Committee, Security in Clinical Information Systems - outlines threat of new technology to confidentiality and gives 9 security principles. Caldicott Committee, Report on the review of patient identifiable information, made 16 recommendations. New National Health Service (NHS) Information Management and Technology (IM&T) Strategy will address confidentiality at the technical level.

Coelho, L. (1998) 'Confidentiality of Patient Records', Health Libraries Review, 15 (4), pp. 282-284.

*609 2000 HHH

Presents a UML (**Universal Modelling Language**) model of HER (electronic health record) / EPR (electronic patient record) confidentiality, based on the National Health Service (**NHS Healthcare Model** (HcM), in the form of 'class' diagrams. At time of publication the model was being implemented using the Jasmine Object Oriented Database systems to demonstrate validity and its ability to support Caldicott Guardians (i.e. the staff appointed in every NHS organisation to be responsible for ensuring patient (information) privacy).

Longstaff, J. J., Capper, G., Lockyer, M. A. & Thick, M. G. (2000) 'HER and EPR confidentiality based on accountability and consent: tools for the Caldicott Guardian', Health Informatics Journal, 6 (1), pp. 45-52.

*207 2002 HHH

Considers issues of privacy, confidentiality and security in context of clinical information systems and sharing information between different agencies (e.g. police, social services). Fundamental principle is doctor / patient confidentiality. Based on this Anderson has developed a **security model** for clinical information systems, comprising 9 principles. Disagreement over whether or not these principles are achievable in reality - may be too high a spec. The authors assessed 3 security logical languages for their effectiveness in handling these principles (**ASL, LaSCO, Ponder**) with mixed success.

Aljareh, S. & Rossiter, N. (2002) 'Towards security in multi-agency clinical information services', Health Informatics Journal, 8 (2), pp. 95-103.

£613 2003 HMM

Privacy and library digital reference query records. Reference queries answered via chat, email or Web forms.

Neuhaus, P. (2003) 'Privacy and confidentiality in digital reference', Reference and User Services Quarterly, 43 (1), pp. 26-36.

£672 2004 HLL

E-health records in US. Data protection laws, but many organizations do not have compliant systems.

Swartz, N. (2004b) 'A prescription for electronic health records', Information Management Journal, 38 (4), pp. 20-22, 24-26.

£188 2005 HML

Hong Kong data privacy laws. p.143 "has not been revised correspondingly to provide sufficient protection to citizens in the new online environment".

Yu, J. W. K. (2005) 'Electronic government and its implication for data privacy in Hong Kong: Can Personal Data (Privacy) Ordinance protect the privacy of personal information in cyberspace?', International Review of Law, Computers and Technology, 19 (2), pp. 143-163.

£750 2005 HMM

E-health records in US and Australia. Differing data protection laws.

Gunter, T. D. & Terry, N. P. (2005) 'The emergence of national electronic health record architectures in the United States and Australia: models, costs, and questions', Journal of Medical Internet Research, 7 (1), p. No page numbers.

5.2. Information Access

Key issues arising from the literature:

Improve access to records, particularly for users of systems, collections. Freedom of Information. Accountability. Preservation for future access.

£201 2001 HMH

E-records and public-sector financial management and the need for a framework for financial accountability in sub-Saharan Africa.

Barata, K. & Cain, P. (2001) 'Information, not technology, is essential to accountability: electronic records and public-sector financial management', Information Society, 17 (4), pp. 247-258.

***202 2001 HHH**

Effect of ICT on public sector accountability, from a value perspective. Research: Delphi study of 30 e-recordkeeping experts looking at risks and opportunities of different technologies for the availability of information for accountability. P266. "The value conflicts presented in this article should be regarded as important design parameters for electronic records management."

Meijer, A. (2001) 'Electronic records management and public accountability: beyond an instrumental approach', Information Society, 17 (4), pp. 259-270.

£413 2001 HMM

Discussion of ERM within the continuum. Archivists losing battle to provide comprehensive intellectual control of and access to holdings. Need major shift in methodology for the 21st century, and willingness to adopt the new technologies that are generating records to document, preserve and provide access to them. Much will have to be done at creation, rather than post-accession. Must develop new audiences as well as expanding service to

core constituencies. Networked use will expand, users will expect to have access wherever they are. Need focus on providing services as well as content digitally. Need to be inclusive. New areas may require new kinds of records, e.g. geo-spatial data. Need to address inadequacies in documenting minority communities.

Hickerson, H. T. (2001) 'Ten challenges for the archival profession', American Archivist, 64 (1), pp. 6-16.

***165 2003 HMM**

Use of XML schemata accessed via a relational database to integrate elements using different metadata systems into a single flexible repository / catalogue. System should facilitate quicker and more exact search and retrieval through the metadata. Conclusion of study: Outlines the flexibility and benefits of the system, including the availability of its metadata for use by other systems. Proposed system a “useful tool in creating a knowledge system” (p.164) through integration and enhanced data-processing / sharing performance.

Chen, R.-S., Lu, K.-Y. & Yu, S.-C. (2003) 'Metadata management system: design and implementation', Electronic Library, 21 (2), pp. 154-164.

***426 2004 HHH**

Randomised controlled trial (RCT) of effects of patient-accessible online medical records - patients with heart failure at the University of Colorado Hospital. P.10 “Overall, this trial suggests that a patient-accessible electronic medical record can be implemented with the potential for a modest benefit in adherence and minimal impact on clinic operations. Although the majority of patients were not interested in online medical records, the fact that fully one-quarter of the patients in the practice were interested demonstrates that this intervention can appeal to a substantial number of patients”.

Earnest, M. A., Lin, C.-T., Moore, L. A., Ross, S. E. & Wittevrongel, L. (2004) 'Providing a Web-based online medical record with electronic communication capabilities to patients with congestive heart failure: randomized trial', Journal of Medical Internet Research, 6 (2), p. No page numbers.

#328 2005 MMM

Wigan Metropolitan Borough Council & Graphic Data Online (GDO) - automation of paper invoice processing. ERP and EDM using GDO as a bureau for scanning paper invoices and making available to WMBC via the Web.

Monk, B. (2005) 'Wigan Council's invoice processing: GDO helps meet requirements and standards', Information Management and Technology, 38 (3), pp. 116-117.

£520 2005 HLM

Work and programme of US National Archives and Records Administration - centres on purpose of national recordkeeping (to preserve and provide access to electronic government record in the long term), and the current ways in which NARA is acting to enable this purpose to be carried out effectively. Initiatives include the Electronic Records Archive (ERA), re-engineering RM, and collaboration on the Persistent Archive Testbed (PAT) and InterPARES.

Weinstein, A. (2005) 'NARA enters new "ERA" of electronic records management', Information Management Journal, 39 (5), pp. 22-24.

#195 2006 MMM

Salford City Council's use of Open Text's Livelink web content management to support it meeting UK e-government 2005 target (e-enabled services) and 24hour service delivery via the web.

Hyland, D. (2006) 'Being "better connected" at Salford: e-enabling public services', Information Management and Technology, 39 (1), pp. 23-24.

#288 2006 MMM

Cheapflights (USA) using Percussion's Rhythmyx ECM software to improve timing and delivery of travel price & resort information on the web. Faster publication of information on the web to give better service.

'Cheapflights turns to Percussion Software: to upgrade flight and resort information to global travellers', (2006) Information Management and Technology, 39 (3), pp. 120-121.

#346 2006 MMM

NHS Pensions Agency use of EDM to improve customer service because agency staff have better access to more information.

'EDRM in the NHS: delivering electronic medical records and improving service and access to information', (2006) Information Management and Technology, 39 (3), pp. 125-126.

£522 2006 MML

Deals with personal rather than corporate electronic records / papers, such as 'electronic personal archives' and blogs etc. Research libraries are having to re-orient themselves to cope with collecting and managing such material and enabling access by researchers and the public.

Burrows, T. (2006) 'Personal electronic archives: collecting the digital me', OCLC Systems and Services, 22 (2), pp. 85-88.

*524 2006 MHH

Qualitative results of questionnaire survey (for an MBA in technology management) on use of EDM by English central government organisations in support of FoI. Number of recommendations made.

Greenaway, N. (2006) 'EDRM: acquisition and implementation across central government', Records Management Bulletin, (134), pp. 19-22.

5.3. Legal Aspects of e-Records

Key issues arising from the literature:

Legal status of e-records, particularly email. Legal admissibility of e-records. e-Discovery. Compliance. Digital signatures.

£293 1996 MMM

PD0008 (UK) on legal admissibility of information stored on EDMS.

Steemson, M. (1996) 'Information managers freed to climb out of the archives into business administration', Records Management Bulletin, (75), pp. 13-15.

£595 1996 MML

Practitioner's viewpoint of DISC PD0008 Code of Practice for Legal Admissibility of Information Stored on Electronic Document Management Systems (UK).

Keenan, H. (1996) 'A user interprets', Records Management Bulletin, (76), pp. 18-22.

£720 1996 HML

Legal status of e-records.

Menkus, B. (1996) 'Defining electronic records management', Records Management Quarterly, 30 (1), pp. 38-42.

£642 1997 HMM

ERMS and medical liability insurance issues.

Grams, R. R. & Moyer, E. (1997) 'The search for the elusive electronic medical record system - medical liability, the missing factor', Journal of Medical Systems, 21 (1), pp. 1-10.

£336 1998 LML

Establishing legal status of e-records in the US.

Fritz, M. (1998) 'CD-R, @CD-Rkive, and the American way of records- keeping', EMedia Professional, 11 (10), pp. 48-50, 53-44, 56.

£337 1998 MLL

Discussion of legal compliance and e-records in New Zealand context.

McGregor, F. (1998) 'Legal compliance issues on the digital area', Archifacts, (Apr 1998), pp. 40-50.

£598 1998 MMH

Description of PD0008 Code of Practice for Legal Admissibility of Information Stored on Electronic Document Management Systems (UK).

Steemson, M. (1998) 'Legal admissibility of information stored on electronic document management systems, or how to make the law love your image', Records Management Bulletin, (87), pp. 49-60.

£48 1998 HML

Clinical context - procedures in moving from paper to e-records system & likely development of legal guidance.

Anderson, R. J. (1998) 'Safety and privacy in clinical systems: the state of play', Health Informatics Journal, 4 (3 and 4), pp. 121-123.

£776 1999 HML

Major developments during the 1990s that have affected ERM, particularly legal admissibility.

Tombs, K. (1999) 'A decade of change for legal admissibility: a personal view', Records Management Journal, 9 (1), pp. 47-59.

#717 1999 HMM

US federal agency. While IT systems design often does not take RK needs into account, this must be an element for federal IT systems, with legal RK requirements.

Van Wingen, R. S., Hathorn, F. & Sprehe, J. T. (1999) 'Principles for information technology investment in U. S. federal electronic records management', Journal of Government Information, 26 (1), pp. 33-42.

£178 1999 HMM

Digital signatures, with coverage of related Australian law.

Wilson, S. (1999) 'Digital signatures and the future of documentation', Information Management and Computer Security, 7 (2), pp. 83-87.

***456 2000 HHM**

Use of e-signatures in the pharmaceutical industry. Used in areas such as R&D, clinical trials, manufacture, quality control, and with some plans to extend to administrative functions. Main driver was further integration of digital records into work practice. E-signatures complex technical issues impact on RM decision.

Whitman, J. (2000) 'Electronic signatures in the pharmaceutical industry: wider issues dominate over the technical and practical?', Records Management Journal, 10 (1), pp. 35-48.

£#707 2000 MMM

US Federal Information resources management (IRM) functions within the concept of the life cycle, with discussion of the legal status of e-records and email.

Sprehe, J. T. (2000) 'Integrating records management into information resources management in U.S. government agencies', Government Information Quarterly, 17 (1), pp. 13-26.

***444 2001 HHH**

Additional content and metadata captured into the e-record raise various legal, social and ethical issues.

Yakel, E. (2001) 'An institutional view of electronic records management: hospitals and teleradiology', Information Management Journal, 35 (1), pp. 26, 28, 30, 32-23.

£692 2001 HMM

Two key US lawsuits on email recordkeeping which helped to establish their current legal status and how they have to be managed.

Wallace, D. A. (2001) 'Electronic records management defined by court case and policy', Information Management Journal, 35 (1), pp. 4, 6-8, 10, 12, 14-15.

£701 2001 HMM

US Food and Drug Administration's (FDA) ruling on e-signatures. Need for retention and disposal policies and management, with responsibilities associated with role rather than person.

Olson, L. (2001) 'Electronic record challenges for clinical systems', Drug Information Journal, 35 (3), pp. 721-730.

£301 2001 HMM

Digital signatures.

Minniham, J. (2001) 'Electronic signatures: a tutorial', Information Management Journal, 35 (4), pp. 4-6, 8.

***730 2001 HHH**

Survey of US librarians. Lack of awareness of legal issues associated with public library records. Recordkeeping part of daily operational activities that is often overlooked. Although records are being maintained, best practices are not being followed. Recordkeeping not understood as a form of accountability. Little awareness of records as vital to business continuity. Institutional records only included in 2 libraries' disaster plans, though not known how many actually had disaster plans.

Yakel, E. & Colligan, C. A. (2001) 'Public library records: issues of accountability and access', Public Library Quarterly, 19 (4), pp. 5-20.

£586 2003 MMH

Legal issues relating to email.

Datskovsky, G. & Moerdler, M. (2003) 'Solving the e-mail challenge: effectively managing e-mails as documents of record', Records Management Bulletin, (113), pp. 5-9.

£436 2004 HMM

Legal aspects of managing e-communications.

Montana, J. C. (2004) 'E-mail, voice mail, and instant messaging: a legal perspective', Information Management Journal, 38 (1), pp. 37-38, 40-41.

#471 2004 MMM

Bayer Healthcare AG's use of Documentum (ECM) for managing research & development documents to meet compliance regulations and standards of the US Food and Drug

Administration (FDA).

'Bayer HealthCare standardises ECM platform', (2004) Information Management and Technology, 37 (3), pp. 131-132.

£188 2005 HML

Hong Kong data privacy laws in the context of e-government. P143 "the Hong Kong Personal Data (Privacy) Ordinance (PDPO) has not been revised correspondingly to provide sufficient protection to citizens in the new online environment".

Yu, J. W. K. (2005) 'Electronic government and its implication for data privacy in Hong Kong: Can Personal Data (Privacy) Ordinance protect the privacy of personal information in cyberspace?', International Review of Law, Computers and Technology, 19 (2), pp. 143-163.

£238 2005 HMM

Describing the 'Sedona Guidelines: Best Practice Guidelines and Commentary for Managing information and Records in the Electronic Age'. Focuses on the legal imperatives for compliance.

Allman, T. Y. (2005) 'Fostering a compliance culture: the role of the Sedona Guidelines', Information Management Journal, 39 (2), pp. 54-56, 58, 61.

£805 2005 MML

Use of email as evidence in investigation of investment advisers in the US.

Martin, L. A. (2005) 'Emails and the Recordkeeping Obligations of Investment Advisers', Investment Lawyer, 12 (2), pp. 16-21.

£750 2005 HMM

Models and costs of electronic health record architectures in the US and Australia. Will EHRs meet legal requirements or will they be a litigation risk?

Gunter, T. D. & Terry, N. P. (2005) 'The emergence of national electronic health record architectures in the United States and Australia: models, costs, and questions', Journal of Medical Internet Research, 7 (1), p. No page numbers.

£4 2005 MML

Discussion of e-content in the law practice. P.26 "as the complex process of documenting, discovering, and conducting legal cases becomes increasingly digital, the storage, management, and even legal obligations surrounding that information become increasingly complex."

Britt, P. J. (2005) 'Econtent and the law practice', EContent, 28 (9), pp. 22-26.

#821 2005 LMM

Kimberly-Clark Co. preparation for US Sarbanes-Oxley Act: setting up internal access controls. Chose a Web-based document management application Risk Navigator. Provides for restricted access based on an employee's duties. P. 52 "You could create the potential for widespread errors, and in the worst case, intentional fraud [without proper control over access] because so much of our business and transactions are run by computers".

Virzi, A. M. (2005) 'Cleaning Up', Baseline, (48), pp. 51-53.

£101 2006 HMM

Use of good RIM policies to avoid adverse legal consequences relating to electronic discovery requirements in US. A document / data retention questionnaire can be used to assess how RIM processes work in an organization and to determine their effectiveness.

Snyder, K. & Isom, D. (2006) 'A 30(b)(6) can sink your ship', Information Management Journal, 40 (1), pp. 52-55.

***1117 2006 MMM**

Validation of software (design) for use in a pharmaceutical Good Laboratory Practice (GLP) environment, as defined & required by the US FDA (Food & Drug Administration) and in compliance with its code of federal regulations (CFR) 21 Part 11 rule on e-records and e-signatures.

Matthijs, N., Dejaegher, B. & Vander Heyden, Y. (2006) 'Data-handling software for a GLP environment: Development and validation requirements', Lc Gc Europe, 19 (12), pp. 656-+.

5.4. Preservation of e-Records

***42 1997 HHM**

Preservation Complexity Scorecard applied to an object helps identify the preservation approach.

Bennett, J. C. (1997) A framework of data types and formats, and issues affecting the long term preservation of digital material. British Library. Research and Innovation Report; (50) 1997, 46pp. ISBN 0712333126.

£38 1998 MML

Digital preservation.

Ashworth, J. & Mayon-White, B. (1998) 'The people's memory: the challenges of long term archiving', Information Technology and Public Policy, 16 (2), pp. 92-94.

£37 1999 HML

Literature review of digital preservation.

Parkes, M. (1999) 'A review of the preservation issues associated with digital documents', Australian Library Journal, 48 (4), pp. 358-377.

***129 2000 HHH**

Costing models for digital records management, with a focus on archiving and long-term digital preservation.

Ashley, K. (2000) 'The costing of digital records management', Records Management Journal, 10 (3), pp. 140-149.

#582 2000 MMH

German reunification - problems of preserving East German archives of e-records.

Wettengel, M. (2000) 'Archiving the united Germany: 1. German unification and electronic records: the example of East Germany's 'Kaderdatenspeicher'', Records Management Bulletin, (95), pp. 11-16.

£457 2000 MMH

Building blocks for managing and preserving digital materials. Blocks: (1) Theories: University of Pittsburgh. UBC. Continuum. (2) Initiatives: ICA committee on e-records. DLM Forum. InterPARES. TEAM project. IRMT modules. RLG. Australian initiatives. Canadian initiatives. USA initiatives. (3) Solutions: Early solutions (Computer museum. Optical technology. Shell concept.) Standards. Migration. Emulation. Metadata (OASIS, CEDARS). XML. Conclusions: p.65. "electronic records are difficult". P.65. "we must not see the problems as exclusively a technical matter for computer experts. They are at least as much a record keeping and record managing problem, which we as archivists and information experts must address." Focus on the solutions to hand that might work for 10/20 years rather than trying for solutions for 100 years ahead.

MacKenzie, G. (2000) 'Searching for solutions: electronic records problems worldwide', Managing Information, 7 (6), pp. 59-60, 62-55.

#121 2002 HMM

Preservation of e-records at State Records Authority of New South Wales.

Findlay, C. (2002) 'Future proof: ensuring the long-term accessibility of technology-dependent records', Records Management Journal, 12 (3), pp. 87-93.

£208 2002 MML

Archiving the Internet.

Bradley, P. (2002) 'Archiving the Internet', Records Management Bulletin, (108), pp. 7-8, 10.

£670 2002 HML

Developing financial management tools for archives and libraries when undertaking decisions about preserving e-records, e.g. cost-benefit analysis, risk-benefit analysis, decision-making models, cost models.

Sanett, S. (2002) 'Toward developing a framework of cost elements for preserving authentic electronic records into perpetuity', College and Research Libraries, 63 (5), pp. 388-404.

***63 2003 HHH**

Business process of Dutch governmental organisations handled via ICTs: preservation a problem.

Meijer, A. J. (2003) 'Transparent government: parliamentary and legal accountability in an information age', Information Polity, 8 (1, 2), pp. 67-78.

£394 2003 MLL

Digital Preservation Coalition.

Jones, M. (2003) 'The Digital Preservation Coalition: working to secure the preservation of digital resources in the UK', Records Management Bulletin, (116), pp. 21-23.

£#382 2004 HML

Problems of archiving US federal records. US federal e-records preservation initiative.

David, J. (2004) 'The looming crisis in federal records management', Journal of Government Information, 30 (4), pp. 436-442.

£23 2004 HMM

Preservation of born digital objects: migration strategy; emulation strategy.

Lynch, C. (2004) 'Preserving digital documents: choices, approaches and standards', Law Library Journal, 96 (4), pp. 609-617.

£427 2004 MMM

Archiving and preservation of electronic data. Issue of evidence, e.g. metadata, digital signatures. Problems of lifetime of hardware / software. Solutions: hard copy; museum of old technology; emulation; migration; standardisation: formats, e.g. use of XML, virtual machines.

Roberts, W. (2004) 'Long term preservation of electronic information', Records Management Bulletin, (123), pp. 3-6.

£674 2004 MLL

Digital preservation. National and international initiatives to set up digital format registries.

Darlington, J. (2004) 'The PRONOM file format registry', Records Management Bulletin, (119), pp. 21-22.

£358 2005 HMM

Digital preservation for historical purposes. Article covers documents, information and records. Focus on importance for involving small organisations and individual citizens. UK legal framework for deposit of digital information 'Legal Deposit Libraries Act 2003', including enabling legislation for future forms of e-material. Discussion of preservation issues, with examples of initiatives in UK and abroad. All stakeholders need to play a part: individuals, small organisations, voluntary bodies, the researcher, the historian, the archivists and archival institutions, the government.

Spence, J. (2005) 'Small organisations and cultural institutions - a digital future?', Program, 39 (4), pp. 366-380.

£522 2006 MML

Research libraries - collecting electronic personal archives. Methods, e.g. digital repositories, transfer into XML, working with individuals to prepare material before archiving.

Burrows, T. (2006) 'Personal electronic archives: collecting the digital me', OCLC Systems and Services, 22 (2), pp. 85-88.

5.5. Risk and Risk Management

*730 2001 HHH

Survey of US librarians. Lack of awareness of legal issues associated with public library records. Recordkeeping part of daily operational activities that is often overlooked. Although records are being maintained, best practices are not being followed. Recordkeeping not understood as a form of accountability. Little awareness of records as vital to business continuity. Institutional records only included in 2 libraries' disaster plans, though not known how many actually had disaster plans.

Yakel, E. & Colligan, C. A. (2001) 'Public library records: issues of accountability and access', Public Library Quarterly, 19 (4), pp. 5-20.

£670 2002 HML

Developing financial management tools for archives and libraries when undertaking decisions about preserving e-records, e.g. cost-benefit analysis, risk-benefit analysis, decision-making models, cost models.

Sanett, S. (2002) 'Toward developing a framework of cost elements for preserving authentic electronic records into perpetuity', College and Research Libraries, 63 (5), pp. 388-404.

£586 2003 MMH

Examples of email disasters. Legal issues relating to email.

Datskovsky, G. & Moerdler, M. (2003) 'Solving the e-mail challenge: effectively managing e-mails as documents of record', Records Management Bulletin, (113), pp. 5-9.

£200 2004 MML

Businesses poor at managing emails. Threats from poor management: Legal liability. Confidentiality breaches. Damage to reputation. Lost productivity. E-mail and court proceedings. Recommends an approach to managing email.

Jeffrey-Cook, R. (2004) 'Email management', Records Management Bulletin, (121), pp. 7-8.

£377 2004 MMM

37 rules of strategic email management. Gives examples of disaster stories.

Flynn, N. (2004) 'How to implement strategic email management: the 37 rules', Records Management Bulletin, (118), pp. 17-21, 24.

£520 2005 HLM

Describes work and programme of US National Archives and Records Administration (NARA). NARA's training programme redesigned (2004) to stress importance of managing records as information assets and of asset and risk management.

Weinstein, A. (2005) 'NARA enters new "ERA" of electronic records management', *Information Management Journal*, 39 (5), pp. 22-24.

£#534 2005 MMM

Business benefits of ERM in ECM context moving from defensive, risk management justification / rationale for records management to offensive, positive benefits rationale for RM. Gives three USA case examples: DARPA (Defense Advanced Research Projects Agency), Nuclear Regulatory Commission's (NRC) ADAMS (Agency-wide Document Access & Management System) and NRC's public key infrastructure e-signature capability. Argues that as an organisation "comes to understand the quality and value of the information held in the ERMS within the ECM" e-records repositories will become the primary place for information supporting business and solving new problems. "The financial savings to the enterprise and costs foregone through re-purposing information already captured and accessible with be readily demonstrable to Chief Information Officers. Emphasizing the positive benefits of EMRS within ECM will bring records management to its proper place in serving enterprise goals and mission."

Sprehe, J. T. (2005) 'The positive benefits of electronic records management in the context of enterprise content management', *Government Information Quarterly*, 22 (2), pp. 297-303.

#821 2005 LMM

Kimberly-Clark Co. preparation for US Sarbanes-Oxley Act: setting up internal access controls. Chose a Web-based document management application Risk Navigator. Provides for restricted access based on an employee's duties. P. 52 "You could create the potential for widespread errors, and in the worst case, intentional fraud [without proper control over access] because so much of our business and transactions are run by computers".

Virzi, A. M. (2005) 'Cleaning Up', *Baseline*, (48), pp. 51-53.

£101 2006 HMM

Use of good RIM policies to avoid adverse legal consequences (US context) relating to electronic discovery requirements. A document / data retention questionnaire used to assess how RIM processes work in an organization and to determine their effectiveness.

Snyder, K. & Isom, D. (2006) 'A 30(b)(6) can sink your ship', *Information Management Journal*, 40 (1), pp. 52-55.

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