

AC⁺erm Project

Philosophical, Paradigmatic and
Methodological Underpinnings



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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 Project

Introduction

Background The AC⁺erm Project was consciously conducted within the terms of explicit methodologies and their underlying philosophies and paradigms. To ensure a rigorous and consistent approach, these were identified and developed before the research process was started. However, as it was inevitable that new factors and aspects would emerge as the process unfolded, various clarifications and amendments were made to the initial documentation and protocols over the course of the Project.

Extensive documentation was maintained to record both the initial perspectives and protocols and any subsequent divergence or development. The 'audit trails' of the participants in the Project, the data gathered through the various research instruments and methods, and the analysis of that data has also been comprehensively documented.

This Publication This document sets out the theoretical framework under which the Project's research was conducted. It is structured to provide an overview of the basic theoretical underpinnings, followed by details of the specific protocols, methodologies and methods used in examining the Project's two main research bases (literature and expert participants). It then sets out the means by which the data from these two bases was documented, stored, and analyzed.

Not all aspects are given equal weight in each section; for example, conducting the Project Colloquia was a straightforward matter that did not require any explication beyond that given in the Introduction to the 'Research Base 2' section. Conversely, conceptualizing and setting up the Delphi Studies was a complex and involved business, and has thus been allocated a separate sub-section.

Similarly, analysis of the data from the Systematic Literature Review was a more straightforward process than analysis of the Delphi data, and any description would have involved extensive duplication of the material from 'Research Base 1': this aspect of data analysis is therefore adequately covered in the introduction to the 'Data Analysis' section, with reference to the earlier material.

Philosophy and Methodology – Fundamentals

Background As with any research project, the AC⁺erm Project was predicated on a number of philosophical and methodological positions, which determined or informed the approach, methods and tools appropriate for carrying out the research.

Both the philosophical approaches and the possible paradigms applicable to the research have been viewed as a continuum rather than as discrete and mutually exclusive positions.

The philosophical stance that underlies the project's conception and activities is fundamentally a realist stance. However, it was also accepted that while there is an external reality, it cannot be apprehended simply in all or most of its aspects, and that our knowledge and understanding of that reality must depend to a significant extent on interpretation. The project's approach to the world was therefore primarily one of Hermeneutical rather than Naïve or 'Strong' Realism.

The project team examined several prevalent paradigmatic schemata for the Social Sciences field. Though these differed in detail and terminology, three basic paradigms are apparent at the highest level: Positivism – 'Post-Positivism' – Constructivism / Interpretivism. These were not considered by the team to be inherently either incommensurable or incompatible: that depended upon the underlying philosophical stance. Aspects of both Post-Positivism and Constructivism / Interpretivism are consonant with the moderate Realist philosophical base, and both therefore contribute to the project's understanding and methods.

The two fundamental categories of methodology are Quantitative and Qualitative. The methodology used is not necessarily tied to any given philosophical base or paradigm, but depends on the nature of the data being queried, the nature of the question being asked, and the reasons for asking it. The project used a mixture of methodologies, appropriate to the specific requirements of any given phase of data collection or analysis.

Systematic Literature Review - Introduction

Background The first phase of the project comprised a major literature review of the topic of e-records management. The last comprehensive literature review on this topic was published in 1996;¹ a bibliography was also published at about the same time.²

The review was conducted using the Systematic Literature Review (SLR) methodology³, which had not previously been used in the records management field

An SLR aims for a more objective, rigorous approach to reviewing the literature. Objectivity and rigour come from establishing elements *a priori* and following a standard process. The stages of a classic systematic review comprise:

1. Framing the question for the review
 - questions should be focussed, precise and specific, and set out *a priori*.
2. Identifying relevant literature
 - searches should be as comprehensive as possible, covering all literature types from online databases, reference lists of selected items, recent journal issues etc, and the grey literature
 - selection criteria (e.g. subject coverage, study and publication type, etc.) established *a priori*. To minimise bias, selection is done independently by different reviewers and their choices compared
3. Assessing the quality of the literature
 - criteria established *a priori* to allow the weighting of individual items based on the rigour of the work. This information can be used for selection and / or interpretation.
4. Summarising the evidence
 - using a data extraction form, established *a priori*, to extract data from the literature that will answer the review's question(s)
5. Interpreting the findings.
 - using analysis methods, established *a priori*, to give meaningful and practical answers to the review's questions(s), considering the strengths and weaknesses of the evidence.

The review output is a narrative report, supported by data tables, a bibliography of the selected items, and a detailed description of the review process itself. Reviews covering quantitative data might also include a meta-analysis.

The classic approach described above was modified to adapt to the nature of the topic and the disciplines covered in the AC⁺erm review: SLRs often use quantitative data, but the material covered by the project and the modes of analysis applied are almost exclusively qualitative. How and why the 'standard' methodology has been adapted will be discussed in one or more articles about the project.

This Section The remainder of this section on the SLR methodology will cover the initial *a priori* decisions and the protocols and tools based on them, and the evolution of the latter to adapt to the realities of conducting the review on the untested ground of the recordkeeping literature and disciplines.

The tense of the original sections of the protocols has been retained to indicate their programmatic nature. Sections indicating alterations to the initial decisions are annotated as such and appear in dark red type to distinguish them from the earlier text.

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- ¹ Erlandsson A. *Electronic records management: A literature review*. ICA Studies 10. Paris, International Council on Archives, 1996, pp.144. ISBN 0-9682361-2-X. <http://www.ica.org/biblio.php?pdoid=5>
- ² Barata K. 'Bibliography of electronic records research to May of 1997'. *Archives and Museum Informatics*, 1997, 11:323–346
- ³ NHS Centre for Reviews and Dissemination guidance on carrying out a review <http://www.york.ac.uk/inst/crd/report4.htm>

Systematic Literature Review - Protocols and Tools

Rationale for undertaking the review

Aims / Purpose:

- to provide a comprehensive, contemporary and critical analysis of relevant resources published since the last major review in 1996 (Erlandsson, A. *Electronic records management: a literature review*. ICA)
- to inform the investigative phase of the research into the three facets (People, Processes, and Systems and Technology) of designing an organization-centred architecture for electronic records management (ERM)
- to begin sharing knowledge and building partnerships
- to develop a rigorous methodology for reviewing resources in a trans-disciplinary subject with a wide range of approaches / publication types for the most part containing qualitative assessments.

There are no systematic reviews which cover the trans-disciplinary aspect of the research and the existing systematic reviews are not adequate because they are restricted to management of electronic patient records.

Review Protocol

Stages of the Review

A pilot review focusing on information and records management resources and covering stage I (Planning the review).

Stage II (Conducting a review) - the systematic review process.

Evaluation of the review for comprehensiveness and identification of gaps.

Choice of Sources and Search Strategy

Search Themes

Searches will be carried out to cover the **six** themes listed below:

- The approaches to, and progress in effectiveness of, managing electronic records
- Organizational vision, drivers and influencers for recordkeeping
- Level of understanding of business processes and the implications for recordkeeping systems
- Standards and models which underpin ERM, including principles and practice taken from managing paper records
- Defining and designing an organization-centred architecture for recordkeeping
- Principles of technology design for effective ERM

Choice of Databases

Databases covering four key disciplines:

1. Information and records management
2. Business and management
3. Health and medical services
4. Information technology

Later amendments: By mid-2009 it had become clear that the volume of material for review required pragmatic decisions about what could be included. It was decided to prioritize LISA as the main database for our discipline.

Grey Literature

Starting-point

While conducting the SLR to date, team members have been adding to a list of resources come across in the course of the SLR itself or of general reading and communications. Versions of this list have been produced for internal and public use.

The edited internal list has been taken as the starting-point for the grey literature search. The categories identified are as follows:

- Book, book chapter.
- Conference
- Consultancy
- Corporation (e.g. Microsoft)
- Government agency (except for archives, records offices, libraries)
- Individual, e.g. website or blog (use Journal for journal articles)
- Journals, journal articles
- Archives, record offices, and libraries run by national, regional, or municipal government
- Major non-government bodies with quasi-regulatory, normative or policy development functions, e.g. ISO, DPC
- Organizations, consortia (profit or non-profit)
- Publishers
- Professional recordkeepers' associations / organizations
- Universities, colleges, institutes (e.g. Smithsonian)

Later amendments: By October 2009, it had become clear that the volume of material for review required pragmatic decisions about what could be included. Therefore, the following decisions were taken to circumscribe the scope of both the selection and review of the grey literature.

The corpus of literature will remain that compiled through the 'SLR Resources' list, based on references found in literature already reviewed and on other material identified from the reviewers' knowledge and reading. This list will be brought up to date with all resources identified by 2009.10.31.

It was agreed that the grey literature be selected from the existing public version of the SLR Resources list. The SLR database entry will be at the entity level (i.e. TNA, not individual documents / toolkits produced by TNA), and the summary field will contain a summary of the nature of the entity and the types of resource it provides

ZETOC – Table of Contents

The initial searches of the bibliographic databases will be supplemented by the ZETOC searches run in February 2009 for the Technology e-Delphi study. This additional search was conducted for the technology literature to ensure that, in a rapidly changing field, issues from recent material could be included in the e-Delphi study. The Zetoc searches comprised (i) a keyword search, and (ii) a search of key journal titles.

Books

In October 2009, it was agreed to identify books for inclusion in the SLR, then to see whether reviews of the relevant books had already been found during the previous searches. Summaries of books to be based on the reviews and publishers' details rather than the books themselves.

Time coverage

All resources will be searched back to 1996 but technology aspects will only be included from 2002 because of rapid change in this area.

Later amendment: In practice, this has been superseded by the use of the three 'qualifying' dropdown options – Current status (IT), Current status (Implementation), Current status (Issues / approaches). This allows the observation of trends and 'state of play' aspects of ERM development which might be lost from sight by simply rejecting outdated solutions or overviews.

Language coverage

All languages will be included but generally only those items available in English will be analyzed. However if there is a very key resource in a foreign language, reasonable efforts will be made to get it translated. Any items excluded from the analysis on the basis of language will be identified, and categorized.

Later amendment: By mid-2009 it had become clear that the volume of material for review required pragmatic decisions about what could be included. Therefore, foreign-language texts were excluded as a class and marked as rejected on the Access database.

Search Records

Searches will involve subject online bibliographic databases, online library catalogues, journal tables of contents, and websites and publications by experts. For each search the following records will be kept:

- Specific resource searched
 - Time period covered
 - Date searched
 - Search strategy used in the database i.e. search terms used / approach e.g. manual scanning of table of contents
 - Specific selection criteria applied (see “Resource Inclusion Criteria” below)

Bibliographic Records

References will be downloaded or manually entered into EndNote bibliographic software, eliminating any duplication. However the number of duplicate items will be recorded.

Trial / Pilot Search

A trial search will be undertaken of the key online database covering the Information and Records Management discipline in order to

- assess the volume of the literature
- access the resources that will be included (see “Resource Inclusion Criteria” below)
- develop the search strategies to cover the range of individual themes against each database or collection of resources.
- test the data extraction and selection tool i.e. Microsoft Access database (see “Data Extraction Criteria” below).

Resource Inclusion Criteria

The review is investigating issues and change in ERM over a significant period of time i.e. from 1996 to 2007. However, given the diversity, extent and availability issues of the possible resources it will be necessary to be pragmatic over the number of items that can feasibly be analyzed within the time-scale of the review.

Data Extraction Criteria

Because of the trans-disciplinary focus of the project and the fact that the majority of the data will be qualitative, a Microsoft Access database has been developed to improve consistency in data entry and facilitate comparison in data synthesis.

The data entry form has been divided into four sections to mirror the stages of the data extraction and selection process (see below). The bibliographic reference will be linked from the Microsoft Access database to the EndNote library via the EndNote ID number.

Data Extraction and Review

Once the search has been completed the references will be downloaded into a single EndNote, using the find duplicates facility.

Working from the EndNote library list in ID number order, the references will be entered into the Resources data entry form. Because the project team members have both subject and information expertise they will all be involved in the review and selection process.

The data entry will be made up of four parts as follows:

1. Minimum Data Set comprising:
 - EndNote id number = Resource Id Number
 - Review sample (Yes/No)
 - Rejection reason
 - Date and name of data entry / first reviewer
 - Select (Yes/No)

Later amendments: further fields added

 - Selection qualification
 - Dynamic resource date
2. Literature mapping comprising:
 - Year of publication
 - Resource type (publication) – drop-down list
 - Approach / study type – drop-down list
 - Main focus (people, processes, technology) – drop-down list
 - Stakeholder group – drop-down list
 - Author sector focus – drop-down list
 - Country (author) – drop-down list
 - Country (focus) – drop-down list (**Later amended to 'Country (base)', with additional 'Focus' Yes/No option**)
 - Focus sector type (macro i.e. private, public, not for profit) – drop-down list
 - Focus sector type (detail c.f. author sector type) – drop-down list
3. Data extraction comprising:

<ul style="list-style-type: none"> ○ Number of subjects ○ Specific example(s) (Yes/No) ○ Approaches (Yes/No) ○ Architecture (Yes/No) ○ Business processes (Yes/No) ○ Partnerships – stakeholders (Yes/No) ○ Partnerships –trans-disciplines (Yes/No) ○ Progress (Yes/No) ○ Risk (Yes/No) ○ Technology (Yes/No) ○ Vision (Yes/No) ○ Model for ERM (Yes/No) ○ Model (paper records) (Yes/No) ○ Other model / paradigm (Yes/No) ○ Capacity building (Yes/No) 	<ul style="list-style-type: none"> ○ Change management (Yes/No) ○ Data protection (Yes/No) ○ Functional requirements (Yes/No) ○ Information access (Yes/No) ○ Information security (Yes/No) ○ Legal / statutory requirements (Yes/No) ○ Quality management (Yes/No) ○ Standard (Yes/No) ○ Technical specifications (Later deleted) ○ Productivity gains (Yes/No) ○ Cost saving (Yes/No) ○ Space saving (Yes/No) ○ Critical success factors (Yes/No) ○ Barriers to change (Yes/No) ○ Other (Yes/No)
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Later amendments: further fields added

<ul style="list-style-type: none"> ○ Drivers (Yes/No) ○ Benefit (Other) (Yes/No) ○ RM Process (Yes/No) 	<ul style="list-style-type: none"> ○ Technology Issues (Yes/No) ○ People (Yes/No)
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4. Summary and evaluation comprising:
 - Summary – memo field to provide detail of elements from data extraction i.e. detail of elements identified from list in 3 above
 - Approach / study type as per ranked list (see Table 1)
 - Resource type (publication) as per ranked list (see Table 1)
 - Reviewer evaluation based on quality / significance of content
 - Reviewer evaluation – justification – memo providing justification for ranking
 - Disputed items summary – memo field to explain nature of dispute / disagreement and resolution
 - Decision outcome – drop-down list.

The final data extraction form is shown in Table 2.

To test the reliability and consistency between ratings assigned by different researchers, the trial / pilot search results will be used as a sample with all hits (other than obvious false drops and foreign language material) to be reviewed by the Senior Research Assistant and separate samples, although with some overlap, being reviewed independently by the Project Director and the Research Fellow.

The pilot showed that, on the whole, agreement between the independent reviewers was good. A few changes were made to the data extraction form.

For the rest of the SLR process, the research team members were each allocated subsets of the literature for review. To support ongoing consistency, a separate document or *aide memoire* was set up to record any additions / amendments to, or clarifications of, the data extraction form that might arise in the course of the SLR. The *aide memoire* has been updated regularly with notes of decisions made through team member consultations or at team meetings.

Study Synthesis

A qualitative synthesis of the data will be used resulting in a narrative report.

The resources will be selected for data synthesis and inclusion in the narrative report on the basis of the combination of their evaluation rankings i.e. Approach / Study type, Resource type (publication) and Reviewer evaluation as per the following rules:

- Selected:
 - All items ranked 'high' for all three rankings
 - All items ranked 'high' for 'reviewer evaluation'
- Considered for exclusion:
 - All items ranked 'low' for 'reviewer evaluation'
 - Items within a large group of similar items
 - Items with limited availability
- Excluded:
 - All items ranked 'low' for all three rankings
 - All items whose focus is primarily technological and which was published before 2002

Later amendments: The nature of the literature meant that most of the items had an 'Approach / study type' of 'Expert opinion – individual' and were ranked as 'Medium'. Therefore the evaluation rankings could not be used as a method of selection for synthesis/output. Therefore all accepted items were synthesized and in the output the evaluation rankings were given for each item. This will enable the reader to weight the item accordingly.

Additionally, the high volume of literature included in the review meant that production of one comprehensive report was not feasible. Therefore a number of reports, focused on specific subject aspects, have been produced.

Table 1 – SLR Resources – Publication types and approach / study types

Publication type	Evaluation
Peer reviewed article	High
Government report (including depts)	High
Legislation (official publications)	High
Conference proceedings	High
Book	High
Chapter in edited book	High
Editorial – informative	High
Standard – published	High
Grey literature – Education / Research	High
Grey literature – Archives and Libraries	High
Grey literature – Government and Global Agencies	High
Grey literature – Major Non-Governmental Bodies	High
Grey literature – Organisations and Consortia	High
Grey literature – Professional Associations	High
Policies, procedures and guidelines – external	Medium
Article (non-peer reviewed / indicative editorial)	Medium
White paper (not government)	Medium
Grey literature – Consultancies	Medium
Grey literature – Individuals	Medium
Product review	Low
Standard – internal	Low
Policies, procedure and guidelines – internal	Low
Internal report	Low
Other	Low

Approach / study type	Evaluation
Systematic review	High
Model design and testing	High
Case study – analytical	High
Research – other (specify in summary)	High
Literature review	Medium
Systems evaluation	Medium
Service evaluation	Medium
Expert opinion – group	Medium
Expert opinion – individual	Medium
Case example – descriptive	Medium
Systems implementation	Medium
Service implementation	Medium
Systems innovation	Low
Service innovation	Low
Process / product development	Low
Combination of approaches	Low
Other	Low
Not specified	Low

Table 2 – Data extraction form

ACERM Systematic Review Data Extraction and Selection Form

Part 1 - Minimum Data Set

Date assigned: 30 July 2007
 Reviewer: Sue Childs
 Resource ID Number: 3
 Dynamic Resource Date: ☐
 Review sample: ☐
 Rejection reason:
 Select: ☒
 Selection qualification:

Part 2 - Literature Mapping

Source Type: Peer-reviewed Journal
 Resource type: Peer reviewed article
 Approach/study type: Case example - descriptive
 Year of publication: 2005
 Country (author): Europe
 Author sector type: Government
 Main focus: Mixed - People / Processes
 Stakeholder group: Not specified
 Focus sector type: Public
 Focus sector type (detail): Government
 Country (base): Europe
 Focus: ☐

Part 3 - Data Extraction

Number of subjects: 11 Danish governmental organisations.
☒ Specific example(s)

☒ Approaches AP
☐ Architecture AR
☐ Progress PR
☒ Critical success factors CSF
☐ Barriers/Problems B/P
☐ Drivers DR
☐ Business processes BP
☐ Quality management QM

☐ Legal/statutory requirements LR
☐ Data protection DP
☐ Information access IA
☐ Standard/Policy ST
☐ Risk RI
☒ Productivity gains PG
☐ Cost saving CS
☐ Space saving SS
☐ Benefit (Other) B/O

☐ Model for ERM ME
☐ Model (paper records) MP
☐ Other model/paradigm MO
☐ RM Process RM
☐ Technology TE
☐ Technology Issues TI
☐ Functional requirements FR
☐ Information security IS

☒ People PE
☐ Change management CM
☐ Vision VI
☐ Partnerships - stakeholders PS
☐ Partnerships - trans disciplines PT
☐ Capacity building CP
☐ Other OT

Part 4 - Summary and Evaluation

Resource type (publication) evaluation: ☒ High ☐ Medium ☐ Low
 Approach/Study type evaluation: ☐ High ☒ Medium ☐ Low
 Reviewer evaluation: ☐ High ☒ Medium ☐ Low
 Reviewer evaluation - justification: Solid project.
 Disputed items summary:
 Decision outcome:

Admin Area ☒ Reviewed

Record: 3 of 1756

Delphi Studies and Colloquia - Introduction

Background *Delphi Studies*

The investigative phase of the project explored three facets of designing an organisation-centred architecture for electronic records management (ERM). These three facets – people issues, understanding work processes, and systems and technologies – were investigated in sequence, the People and Process phases taking place in 2008 and the Technology phase in 2009.

Informed by the Systematic Literature Review, the investigations combined e-Delphi studies and face-to-face colloquia involving a mix of experts, disciplines and recordkeeping stakeholders. The Delphi studies gathered primary data from selected participants (~20 people per facet) and developed a picture of 'expert opinion' on each facet (People, Processes and Technology). Their electronic form enabled anonymous and geographically wide participation.

The Delphi technique was developed in the 1950s at the Rand Corporation to gather a consensus of 'expert' opinion. It has been used for problem-solving, planning, futures research, forecasting, policy formulation and decision-making. It is particularly popular in the fields of business, education and health.

Colloquia

The analysis of the Delphi Study data provided the basis for the discussions held in the series of free Project colloquia, intended to facilitate further data collection and ongoing dissemination of results. These events also proved to be valuable focal points for discussion and interaction between records professionals, academics in the recordkeeping disciplines, and experts and users from a wider base of disciplines and groups.

The first aim of the colloquia was to validate and extend the Delphi studies through face-to-face discussions between a larger audience of participants. The two methods (of e-Delphis and colloquia) provided a sound balance in terms of data collection enabling expert opinion, experience and views on each issue to be gathered; practical solutions to be shared and refined, and partnerships to be built. The second aim was to keep delegates informed of our research progress and to share ongoing findings.

The first colloquium, focused on the outputs of the e-Delphi study on the 'People' issues of ERM, took place in London on 09 October 2008. Just under 50 delegates attended and contributed to a series of discussion forums, adding to and extending the e-Delphi data.

The second colloquium, based on the e-Delphi study on the 'Process' aspects of ERM, was held in Birmingham on 26 March 2009. Over 30 delegates contributed to discussion forums and to a workshop in which they examined and commented on a number of prototype vignettes / tools based on the data gathered to date.

The third colloquium, dealing with the results of the Delphi study on the 'Systems and Technology' issues, was held in Edinburgh on 24 September 2009. Delegates explored the issues and solutions through discussion and use of some of the project vignettes / tools.

The fourth and final colloquium was a more substantial event, presented as the latest in the well-received Northumbria Witness Seminar Conference series. It was held on-campus at Northumbria University in

Newcastle upon Tyne on 04 March 2010; a group of 50 delegates and witnesses discussed and debated the links and synergies, actual and desired, between research and practice in the field of Records and Information Management.

Details of the colloquia programmes and discussions can be found in the Project output publication *Project Colloquia: Programmes and Summary*.

This Section The remainder of this section on the Delphi Studies and Colloquia will focus on providing further information on the Delphi method and the ways in which it was implemented in the course of the AC⁺erm Project.

Delphi Studies

Delphi Methodology

The Delphi technique was developed in the 1950s at the Rand Corporation¹. The 'classic' Delphi technique comprises setting up a panel of experts. The members are kept anonymous from each other, although each is known to the researcher. Questionnaires are used, originally paper, and each expert communicates individually with the researcher. The first round is a set of open questions to derive as many views and issues as possible. These are analysed qualitatively by the researcher to develop a set of themes. In the second round these themes are then presented in a structured questionnaire and the experts are asked to rank or rate them using a scoring technique. The results are analysed quantitatively and the themes ordered by their rank value. These results are then presented in a third round for a further set of ranking and reanalysis. Sometimes further rounds are used. The end result is a convergence of the findings.

However, the Delphi technique has developed in many different ways from the 'classic' design². A common modification nowadays is that data collection is through electronic means. A modification used in Delphi studies carried out by Northumbria in the field of records management is that it is sought not to 'force' consensus, but rather to explore both consensus and divergence. Additionally, it is sought to capture the richness of the discussion through an emphasis on qualitative analysis, though quantitative analysis is also used where applicable.

The AC⁺erm Project Delphi Studies

The investigation considered what (if any) vision organisations had for their office environment; their vision of recordkeeping in the context of their mission; the drivers and influencers for ERM – e.g. risk management, compliance, corporate governance; and the barriers to implementing ERM.

Within this framework, the Delphi studies addressed:

- whether organisations understood how people work, how they create and use information, how they collaborate, how decisions are made;
- what this implies for recordkeeping systems;
- what people changes have occurred, and are required, for ERM;
- how well organisations understood their 'business' processes;
- whether their understanding of working practices and processes influenced their choice and design of systems and technologies;
- what principles of design underpinned the technology that can deliver effective records management;
- what progress had really been made in ERM in the wired and wireless office environment;
- what strategies, tactics and practical solutions were working.

The analysis of the Delphi Study data yielded a variety of 'standard' qualitative and quantitative outputs. It also informed the development of a series of vignettes / tools, taking the form of one or more scenarios that distil the challenges and problems and present possible solutions, and provided the basis for the discussions held in the series of colloquia.

Details of the outputs from the Delphi Studies are available in the 'Outputs and Findings' pages of the Project website www.northumbria.ac.uk/acerm/.

First Delphi Study – People

The first facet of the investigative phase of the project related to the human and 'people' aspects of managing e-records. It included vision; awareness; culture; drivers and barriers; and the implication of such factors for the implementation of recordkeeping systems.

Participants in the Delphi study on the people and human aspects of ERM responded to five rounds of questions to identify, explore, and clarify the issues and solutions. We analysed the participants' responses using a range of different approaches (subject themes, numerical ratings, subjective explorations) to provide a broad view of the data. The outputs were produced in textual, numerical, graphical and diagrammatic forms to support different cognitive styles.

The study was carried out over five rounds, moving from identification and exploration of the issues through ranking them in order of urgency or importance to suggesting solutions. Finally, an online survey was conducted to discover how the wider RM profession and other stakeholder groups rated the solutions in terms of their desirability, feasibility, impact, priority and urgency.

Second Delphi Study – Processes

- The second facet of the investigative phase of the project related to the process aspects of managing e-records. It included
- business processes and practices;
- business systems (not only IT systems);
- workflow; information flow across the organisation as a whole and within parts of it;
- the information / records management processes as a sub-set of business processes.

Participants in the Delphi study on the process aspects of ERM responded to five rounds of questions to identify, explore, and clarify the issues and solutions. We analysed the participants' responses using a range of different approaches (subject themes, numerical ratings, subjective explorations) to provide a broad view of the data. The outputs were produced in textual, numerical, and tabular forms.

The study was carried out over five rounds, moving from identification and exploration of the issues through ranking them in order of urgency or importance to suggesting and evaluating solutions. The first four rounds were carried out by means of a series of questionnaires; the final round involved the completion of an online survey.

Third Delphi Study – Systems and Technology

The third facet of the investigative phase of the project related to the systems and technology aspects of managing e-records. It considered issues in terms of the design principles for delivering effective recordkeeping, and included

- line-of-business and office systems used by organizations;
- mobile technologies supporting mobile working;
- web-based technologies;
- multiple forms of information;
- citizen-based online transactions;
- personal use of computers and the Internet.

Participants in the Delphi study on the systems and technology aspects of ERM identified, explored and clarified the issues in three rounds of questions and a final exercise in which solutions arrived at in previous rounds were evaluated by a number of set criteria. The first three rounds were carried out by means of a series of questionnaires; the final round involved the completion of an online survey.

¹ Dalkey, N. and Helmer, O. 'An experimental application of the Delphi method to the use of experts'. *Management Science*, (3) (1963), pp.458–467

² Linstone, H.A. and Turoff, M. (eds) *The Delphi method: techniques and applications* (2002). A reproduction of the original 1975 text. Information Systems Department, College of Computing Sciences, New Jersey Institute of Technology, Newark.
<http://www.is.njit.edu/pubs/delphibook>

Data Analysis

Background *Systematic Literature Review (SLR)*

Summary data for the SLR was stored in the Access database that comprised the main data extraction form along with a subsidiary form which included additional details to connect each resource with its origin.

The large number and specificity of the database fields allowed for flexible and multi-faceted querying of the data to generate reports on a desired aspect. Each database record included a free-text field in which the reviewer summarized the content of the resource – depending on the density or value of the resource, summaries ranged from cursory notes to considerable detail.

Some analysis was carried out in a quantitative manner (e.g. identifying the number of resources relating to ‘People’ issues; detailing of country of origin for authors; quantifying the proportions of peer-reviewed to non-peer-reviewed resources). However, the bulk of analysis has been qualitative, involving the synthesis of items on a particular topic by identifying themes from the summary and organising the items under appropriate headings.

For details of the database and the fields on which analysis and reporting were based, see pp.4-7. During the lifetime of the project, analyses of the literature on a range of topics - people aspects, process aspects, technology aspects, case studies, critical success factors - were completed. These can be found in the ‘Outputs and Findings’ pages of the Project website www.northumbria.ac.uk/acerm/.

Delphi Studies

The responses to the three Project Delphi Studies were cut and pasted into a purpose-built Access database which contained details of both respondents and responses. For each completed questionnaire, a new database record was set up to link the responses to the appropriate participant and Delphi round. The responses to the Delphi Studies were rich and extensive, and were analysed in a number of ways.

The primary method of analysing or summarising the data received was by thematic analysis, whereby the data received in free-text, discursive form was distilled into a series of themes using a controlled vocabulary developed in tandem with the emerging themes. The expanding list of themes and controlled vocabulary terms were managed in an Excel spreadsheet.

For the People and Process Delphi Studies, responses for certain of the rounds was also subjected to Phenomenological Analysis, a method of providing subjective insights into a topic (phenomenon) through the researchers exploring it in depth using their experience and imagination.

In those rounds of the studies that involved ranking or evaluating issues, quantitative analysis was also applied and results output in the form of tables and graphs.

In addition to collecting and collating data from the Delphi process itself, details of the participants were also collected to facilitate analysis of, for example, the stakeholder group(s) to which the participants belonged or the sector in which they worked. These details were linked to the responses

Analyses of the Delphi Study data can be found in the ‘Outputs and Findings’ pages of the Project website www.northumbria.ac.uk/acerm/