INTERNATIONAL COUNCIL ON ARCHIVES

AUSTRALASIAN DIGITAL RECORDKEEPING INITIATIVE

Principles and Functional Requirements for Records in Electronic Office Environments

MODULE 1 - OVERVIEW AND STATEMENT OF PRINCIPLES
1. INTRODUCTION

1.1 Preface

A variety of functional specifications for records management software have been developed in the international community. In 2006 the International Council on Archives agreed to develop a harmonized, generic suite of recordkeeping functional requirements for software products based on those existing jurisdiction-specific specifications and to do so in manner consistent with ISO 15489, the international records management standard. It is hoped that this harmonized suite of guidelines and functional requirements will guide and assist jurisdictions that are developing or looking to adopt their own functional specifications as well as inform the update and revision of previously existing standards. The application of this set of functional requirements is not only meant to inform the development of electronic records management software (ERMS), but also to aid in the development and incorporation of recordkeeping functionality into generic business information systems software products as well as specific line-of-business systems. These specifications are also relevant for use by the private sector (e.g., multi-national corporations) as a stand-alone tool.

This project is being sponsored by the International Council on Archives as an activity in its Electronic Records & Automation Priority Area, lead by George Mackenzie, Director of the National Archives of Scotland. Adrian Cunningham (National Archives of Australia) acts as Project Coordinator. Archives New Zealand (Stephen Clarke) is acting as the Secretariat for the project. Other participating countries include: Cayman Islands (Sonya Sherman), United Kingdom - England and Wales (Richard Blake), Germany (Andrea Hänger and Frank Bischoff), Malaysia (Mahfuzah Yusuf/Azimah Mohd Ali), Netherlands (Hans Hofman), Scotland (Rob Mildren and Steve Bordwell), South Africa (Louisa Venter), Sweden (Göran Kristiansson), and the United States (Mark Giguere). The project is also supported by the Australasian Digital Recordkeeping Initiative (ADRI), a collaborative venture sponsored by the Council of Australasian Archives and Records Authorities (CAARA).

1.2 Scope and Purpose

The aim of the project is to produce globally harmonized principles and functional requirements for software used to create and manage electronic records in office environments. There currently exist a number of jurisdiction-specific sets of functional requirements and software specifications, so the aim is to synthesize this existing work into requirements and guidelines that meet the needs of the international archival community and that will enable that community to speak with one voice to the global software industry.

The objectives of the project are:
- To enable better recordkeeping in organizations at all levels of government regardless of juridical domain;
- To support the business needs of the organization by enabling greater effectiveness and efficiency of the operations;
- To provide, through wider deployment of automated recordkeeping functionality,
enhanced abilities to support auditing activities;  
- To enhance capabilities to comply with statutory mandates specified in various information-related legislation (e.g. data protection and privacy);  
- To ensure good governance (e.g. accountability, transparency, enhanced service delivery) through good recordkeeping;  
- To increase general awareness of automated recordkeeping capabilities via the dissemination of key principles; and  
- To maximize cross-jurisdictional consistency regarding the articulation of recordkeeping functional requirements and to enable the global archival community to speak with one voice to the software vendor community.

The primary focus of this suite of guidelines and requirements is on the creation and management of records in electronic office systems. As such, requirements for the long-term preservation of digital records are out of scope. Additionally, it was determined by the ICA work group that certain aspects of standardizing recordkeeping automation were out of scope for this activity. As the ambition for the breadth of application of this document is global, it is impossible, given the wide juridical range of potential applications, to include detailed implementation guidelines. Also, as the ultimate testing environment for the basis of this standard is yet to be determined, inclusion of specific software test cases or scripts was also deemed out of scope.

1.3 Audience

There are three key audiences intended for this specification:
- Software developers and vendors – not limited to records management software, such that this document will serve as a universal standard for recordkeeping compliance;  
- Jurisdictional standard setters – such that this standard can serve as either the baseline for nascent standards development efforts or as a basis for evaluating the revision of already existing ERM standards, and  
- Government agencies – such that all business functions can be evaluated against and facilitated via the incorporation of automated records management capabilities.

A secondary audience for this specification are private sector organizations that wish to incorporate automated electronic records management into their business operations.

1.4 Structure and Use

The suite of guidelines and functional requirements is organized into three modules:

1. **Overview and Statement of Principles**: This introduction, which conveys background information, organization, fundamental principles and additional context;  
2. **Guidelines and Functional Requirements for Electronic Records Management Systems (ERMS)**: A global, high-level statement of core and optional requirements, including application guidelines and a compliance checklist; and,  
Given the stated scope of this project, several non-mutually-exclusive use scenarios are briefly presented here to exemplify how this standard might be used.

- Integrating ERM Software into a Business System
  In this scenario, an organization could use this harmonized standard to selectively incorporate specific records management functionality into existing business systems.

- Developing Jurisdiction-specific Specifications and Standards
  In this scenario, an organization could use this harmonized standard as either the basis for its own juridical ERM specification or as a comparative resource when considering the revision of existing local ERM standards.

- Designing/re-designing Software Products During Software Enhancement Cycles
  In this scenario, software developers could use this harmonized standard as a list of potential functionalities which may warrant consideration and/or inclusion in upcoming planned releases of established software products (not necessarily limited solely to ERM software products).

- Procuring, deploying and configuring ERMS software
  In this scenario, an organization could use this harmonized standard to form the basis for a functional requirements statement in formulating a request-for-proposal for ERM software procurement and implementation.

- Reviewing of Recordkeeping Functionality in Existing Software
  In this scenario, an organization could use this harmonized standard as a ‘checklist’ to establish which required and desirable recordkeeping functions are present in deployed, non-recordkeeping software.

- Evaluating of Software Considered for Purchase
  In this scenario, an organization could use this harmonized standard as a basis for evaluating and comparing capabilities of COTS ERM software.

- Using as a Design Specification for In-house Software Development
  In this scenario, an organization could use this harmonized standard could be incorporated into the software design and testing documentation of software development efforts coordinated by in-house IT staff.

2. **GOOD PRACTICE: Electronic Recordkeeping and the Role of Software**

As organizations introduce new technologies and new methods for doing work, older methods and procedures for controlling records may become less effective. In many organizations, valuable records are kept in centralized databases or shared directories. Alternatively, and **not** mutually exclusively, they may be widely distributed and stored on the decentralized hard drives of individual's personal computers. Further complicating the
situation, in either of these scenarios not all of the stored information may constitute records.

In either case, measures needed for integrity and authenticity may be overlooked and the electronic records may not be available, understandable, and usable to the organization or to the relevant archival institution.

Organizations that already rely on electronic records to conduct and document business or that are interested in eliminating paper records from their systems are seeking solutions to issues of authenticity, management, and retention of electronic records. The decisions that organizations take today about the capability of their information systems, the organization and structure of their information resources, and the policies and practices for recordkeeping in the digital environment will have a significant impact on the types of strategies and methods that archival institutions can employ to ensure long-term preservation of records with archival value.

Because the issues of archival management, especially in the electronic environment, are closely linked to the design of systems and the establishment of new information policies, archivists have been driven to examine a broader set of records management issues in order to carry out the archival function in the digital environment. Software, such as that in functional compliance with those specifications examined in this effort, provide business process owners, records managers, and archivists with substantial means of complying with the practice of good electronic recordkeeping.

3. GUIDING PRINCIPLES

Successful organizations need information systems for making, keeping and using authentic evidence (i.e., records) of business activity they need to meet their business needs and legal obligations. In the electronic environment the development and implementation of such systems should be informed by the following principles:

Records-related principles

1. Electronic business information has to be actively managed and reliably maintained as authentic evidence of business activity.
   As business processes become more completely automated, the electronic information generated by such activities may serve as the only such evidence of specific transactions or decisions. Maintenance of this evidence, as records, is necessary for operational viability and accountability of the organization. This involves identifying a set of electronic information which will serve as the evidential record.

2. Business information has to be linked to its business context through the use of metadata.
   In order for information to have the capability of functioning as a record, it is necessary to augment that information with additional data (i.e., metadata) that places it in the context of the business operations and computing environment in which it was created. In the case of line of business systems accomplishing uniform

\[^1\] http://www.ica.org/biblio/guide_11.html
transactions, this context is derived from the system and its documentation. In other systems, however, such contextual information must be appended to the record as it is necessary in order to provide the record with sufficient longevity for interpretation and to maximise its value and utility as evidence of business activity.

3. Business information has to be kept and must remain accessible to authorised users for as long as required.
   Design and deployment of business information software must ensure that records may be searched for, retrieved and rendered in accessible formats and media, for as long as is required for business and legal purposes.

4. Business information has to be able to be disposed of in a managed, systematic and auditable way.
   A hallmark of appropriate recordkeeping is the retention and appropriate disposition of records generated by business processes according to specified rules. Systems need to be able to dispose of records in a systematic, auditable and accountable way in line with operational and legal requirements.

**Systems-related principles**

5. Systems for capturing and managing business information have to rely on standardised metadata as an active, dynamic and integral part of the recordkeeping process.
   Automated recordkeeping solutions offer powerful capabilities to access and attach standardized contextual information to record content at different times during the life of the record via application of standardized vocabularies and taxonomies.

6. Systems have to ensure interoperability across platforms and domains and over time.
   Electronic evidence, in the form of records, often has operational or juridical requirements for persistence over periods of time that may exceed the lifespan of the hardware or software that created it. As such, record information must be encoded in a manner which is understood and is able to be modified, if necessary, for migration to newer technology platforms.

7. Systems should rely as far as possible on open standards and technological neutrality.
   Many software products that create or manage records are developed using proprietary implementations; this can have adverse effects in the long-term to access and preservation of record material via the introduction of hardware or software dependencies. Use of open standards ameliorates these technological dependencies.

8. Systems should have the capacity for bulk import and export using open formats.
   Electronic records resulting from a business process and managed by recordkeeping software may contain hardware or software dependencies. Recordkeeping software should ideally incorporate capabilities to remove these dependencies via support for bulk re-formatting as part of ingest or export capability or, at a minimum, via non-proprietary encoding of record metadata.

9. Systems must maintain business information in a secure environment.
   For security purposes, systems automating a business process often incorporate safeguards that limit which actions particular individuals can take with electronic information (e.g., viewing, printing, editing, copying, etc.).
10. As much metadata as possible should be system generated.
   Human factors research indicates that end users are typically willing to interrupt their workflow no more than three times in the accomplishment of tasks ancillary to the primary activity at hand. Given the volume of recordkeeping metadata, it is impractical to expect end users to supply much of this information. Systems should be designed and implemented in a manner which allows automatic population of record metadata fields.

11. Systems should support good business information management as an organic part of the business process.
   Although it is not necessarily appreciated as such, good recordkeeping practices are an integral part of any business process. When automating any business process, one should always evaluate the advisability of simultaneous integration of recordkeeping software.

12. It should be as easy as possible for users to create/capture records of business activity.
   It is necessary to design systems/software which automate recordkeeping in a way, ideally, which makes such recordkeeping ‘transparent’ (i.e., not noticeable) to the end users.

4. IMPLEMENTATION ISSUES

4.1 Components of Successful Electronic Business Information Management

Good software is only one component of successful electronic business information management in organizations. Other components include:

Policy frameworks --
Concomitant with the deployment of software with recordkeeping functionality, it is necessary to conduct an analysis of existing information management and security policies and laws to address areas where policy revision may need to occur because of gaps in software capabilities, including policies relating to recordkeeping responsibilities for different categories of employees, records retention and disposal. Associated with the policy frameworks that guide and support good business information management software may be tools such as classification schemes and metadata models.

Business process analysis --
It is a preferred practice that process re-engineering should ideally precede any information technology deployment. This includes identifying, articulating and potentially re-allocating roles and responsibilities.

Project management -
Any information technology deployment requires careful planning and monitoring across a series of discrete stages. Project management techniques are powerful tools which provide both temporal and fiscal accountability for such efforts.

Change management –
Deployment of automation within an organization changes not only the manner in which business processes are accomplished, but the roles and responsibilities of end users of the system. Care must be taken to adequately prepare the ‘human
component’ of any information technology deployment for these changes.

Risk management -
As with any IT system deployment, the decision to automate recordkeeping should be informed by an analysis of risks associated with an analysis of alternatives which are formulated as part of the business case.

Sustainability -
Development and maintenance of automated systems generally straddle organizations’ budgeting cycles. When automating recordkeeping, care must be taken, as part of the development of a business case for the automation effort, to provide for the on-going viability, operations and maintenance of the system.

Capability development -
Software automation requires organizations to develop or enhance the technical capabilities of affected line staff as well as others in the organization; that in some cases may have no familiarity with the technology. Care must be taken to develop these capabilities, as well as the technical capabilities of the organization necessary to support and maintain automation efforts.

Quality management -
Deployment of automated solutions requires the development, within an organization, of a capability to evaluate and accept software performance according to a variety of criteria. Additionally, criteria related to the impact of software deployment to a business process must be developed and evaluated.

Configuration management --
It is necessary to ensure that the software not only has the necessary recordkeeping capabilities, but that the capabilities are configured correctly and in such a way that enables it to operate appropriately in an organization’s IT infrastructure.

Corporate culture -
It is vital that the culture of the organization reinforces the value and importance of good recordkeeping as something that is a standard expectation of all employees. Such expectations need to be regularly articulated by the Chief Executive through line management channels.

4.2 Risks and Mitigations2

Risks typically associated with software deployments fall into many categories. Some of these include:

- **Software selection risks:** Making an appropriate determination, from a range of COTS products, which product is best suited for deployment in your organization.

- **Software development risks:** Experiencing difficulties related to dependence on

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software vendors or developers, including delays in releases of the software or inability of the vendor to be able to diagnose and fix software problems.

- **Technical compatibility risks:** Inadequately accounting for difficulties in integrating the ERM software into the information technology infrastructure of the organization.

- **Communications risks:** Inability to effectively communicate progress and/or issues regarding the deployment to end users or management.

- **Documentation risks:** Inability to implement adequate programmatic recordkeeping surrounding software deployment efforts.

- **Project management risks:** Inability to appropriately track schedules or concomitant resource expenditures can threaten the overall stability of a project.

- **Training risks:** Ineffective training on new software solutions that can engender difficulties in end user acceptance of new technologies.

- **Risks associated with initial declines in productivity:** Until end users become familiar with new, automated business processes, overall productivity may initially suffer due to the introduction of software innovations.

- **Staff turnover risks:** Changes in either senior management championing or in the responsibilities for key personnel within the groups implementing a software deployment can have an adverse effect on the overall project.

- **Scalability risks:** The extent to which software may need to ‘scale up’ to enterprise-wide deployment needs to be considered and planned for at an early stage in the project.

Any organization deploying software should acknowledge that some prudent risk-taking is necessary when it comes to adopting new technology and changing business processes, as an ERM software surely will require. One means of mitigating the risks associated with such a deployment is to mount a pilot deployment in a section of the organization before expanding use of the software enterprise-wide.

To minimize the risks associated with a pilot launch, the project team should:

- Establish clear performance objectives and evaluation criteria;

- Involve and continually encourage pilot project participants to use the system;

- Perform prototype work sessions with the software before customizing it;
• Finalize system design;

• Develop quality acceptance methodology;

• Expand the pilot through incremental rollout to other areas of the agency and inclusion of other record formats; and

• Assure that the pilot's requirements are measurable and clearly understood by participants.

Enumerating problems that the project team is likely to encounter—identifying possible ways in which to avoid or promptly address those situations—will minimize disruptions during the pilot, allowing you to maintain the schedule you have developed for your pilot project. To better prepare for these eventualities:

• Review of similar projects will help to identify potential problems that you may encounter as you begin your ERM pilot.

• Conducting pre-planning brainstorming exercises with your team can help you anticipate the challenges ahead.

For each potential problem, develop a contingency plan for what you will do if the problem occurs. This "best management" practice will increase the governance body's confidence in your team's ability to successfully implement ERM agency-wide. The following illustrate successful strategies for dealing with problems frequently encountered:

• Organizations often encounter resistance to changing work processes as ERM is introduced. One e-mail pilot project found that introducing newly hired employees, at the beginning of their employment, to the importance of good records management was the best strategy for conquering resistance to change regarding ERM.

• A version of the software will be up and running for use by the project pilot team before roll-out to the first group of pilot participants. Selecting individuals to train and work with the software during this pre-pilot phase will develop a cadre of relatively sophisticated users who can serve as liaisons with the groups targeted as initial pilot project participants. When the quality of this pre-pilot phase is deemed acceptable, you can formally launch your ERM pilot.

• Managing users' expectations throughout the pilot will minimize the risk of pilot failure. This can be achieved, in part, through user training and constant communication with pilot project participants. Establishing communication vehicles for the rest of your agency (e.g., a "public" view of your pilot project Web site or online newsletter), keeping staff apprised of the progress being made vis-à-vis ERM, reminds people that the project is ongoing. This will make deployment in their area easier if the solution is adopted organization-wide.
4.3. **Financial and Organizational Sustainability of Electronic Systems**

Each juridical environment likely has established processes designed to ensure the financial and organizational stability of any capital investment. Although potentially conceptually oversimplified, the totality of analyses comprising a *business case* can be thought of as the collective means by which an organization ensures this stability in the case of an IT investment, such as recordkeeping software.

In its simplest form, a business case articulates a variety of analyses which substantiate an acquisition proposal for the expenditure of an organization’s capital in accordance with its capital asset strategy and inventory control of such investments. In the case of recordkeeping software acquisition, such a business case might consist of:

- Acquisition strategy – summarization of funding requirement for project stages (including into future fiscal years);
- Program management – detailing program management team membership and responsibilities;
- Enterprise architecture – delineation of how a particular software acquisition relates to other existing and planned IT components within an organization;
- Analysis of alternatives – describing alternatives which were considered, lifecycle costs and returns on investments associated with each;
- Risk management – description of the major risks for the selected alternative indicating probability of occurrence, impact and mitigation strategies;
- Performance goals – articulating which of the organization’s strategic goals are supported by the proposed deployment, inclusive of existing baseline measures and resulting performance improvements according to specific proposed performance metrics; and
- Project management – presentation of detailed work breakdown structures delineating accomplishments and cost of attaining major project milestones.

5. **STANDARDS REFERENCED AND EVALUATED**

The aim of this effort is to harmonize multiple existing electronic recordkeeping software specifications. The result of this effort is to comply with the general requirements set forth in the International Standards Organization’s *Records Management, ISO 15489, Parts 1 and 2* (2001) and *Records Management Processes: Metadata for Records, Part 1: Principles and Part 2: Implementation Issues, ISO 23081* (2006 and 2007). The standards considered were as follows:

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### State Records of South Australia


### State Records of South Australia

- **Across Government EDRMS Panel of Products Procurement and Pre-Implementation – Guideline, Version 1** (October 2004)

### The National Archives, United Kingdom


  - Link to various documents from:

- **Requirements to Sustain Electronic Information Over Time (March 2006)**

- **Functional Requirements for the Sustainability of Electronic Records Management Systems (March 2006)**

### 6. GLOSSARY OF TERMS USED IN MODULE 1 OVERVIEW

**Archives** - Materials created or received by a person, family, or organization, public or private, in the
conduct of their affairs and preserved because of the enduring value contained in the information they contain or as evidence of the functions and responsibilities of their creator, especially those materials maintained using the principles of provenance, original order, and collective control.

Archival authority – Agency or program responsible for selecting, acquiring, preserving and making available archives, also referred to as an archival agency, archival institution or archival program.

Business case -- A structured proposal for business improvement that functions as a decision package for organizational decision-makers. A business case includes an analysis of business process performance and associated needs or problems, proposed alternative solutions, assumptions, constraints, and a risk-adjusted cost-benefit analysis.

Business system – A deployment of an IT system or software in support a particular line of the organization’s overall business (i.e., other than recordkeeping).

COTS – Commercial, off-the-shelf software.

Disposition – Range of processes associated with implementing retention, destruction or transfer decisions which are documented in disposition or other instruments.

Electronic record – Records on digital storage media, produced, communicated, maintained and/or accessed by means of electronic equipment.

End users -- In information technology, the term end user is used to distinguish the person for whom a hardware or software product is designed from the developers, installers, and servicers of the product.

ERM software – Electronic Records Management software; specialized software used to automate the management of records.

Human factors -- The study of how humans behave physically and psychologically in relation to particular environments, products, or services. In a typical human factors or usability study, a group of hired or volunteer test subjects that represent future end users is given tasks to do with a working prototype or early version of a product.

Information -- Knowledge communicated or received. The result of processing, gathering, manipulating and organizing data in a way that adds to the knowledge of the receiver.

Information technology -- A term that encompasses all forms of technology used to create, store, exchange, and use information in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms, including those not yet conceived).

Metadata – Information used to manage, describe, find and preserve other information over time.

Migration – Moving records, while maintaining authenticity, from one electronic system to another without major conversion or inputting of data.

Open software -- In a computing context, open software operates under an open source operating system, typically composed of coordinated modular components from a number of sources and not reliant upon any proprietary elements. Characteristics of open software includes the exposure of the
source code, which is thus available for understanding and possible modification and improvement; portability, which allows the system to be used in a variety of environments, and interoperability, which allows the system to function with other systems.

Pilot project – An experimental initiative lasting for a limited time, the results of which are systematically evaluated.

Proprietary software– Software that is owned exclusively by a single company that carefully guards knowledge about the technology or the product's inner workings.

Process re-engineering – The analysis and redesign of workflow within and between enterprises.

Record – Information created, received and maintained as evidence and information by an organization or person, in pursuance of legal obligations or in the transaction of business.

Recordkeeping – The systematic creation, use, maintenance, and disposition of records to meet administrative, legal, financial and societal needs and responsibilities.

Reformatting – To create a copy with a format or structure different from the original, especially for preservation or access.

Return on investment – For a given use of money in an enterprise, the ROI (return on investment) is how much profit or cost saving is realized. An ROI calculation is sometimes used along with other approaches to develop a business case for a given proposal.