TECHNICAL SPECIFICATION

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Information and documentation — Processes and functional requirements for software for managing records —

Part 2: Guidance for selecting, designing, implementing and maintaining software for managing records

Information et documentation — Processus et exigences fonctionnelles applicables aux logiciels de gestion des documents d'activité —

Partie 2: Recommandations pour le choix, la conception, la mise en oeuvre et la tenue à jour des logiciels de gestion des documents d'activité d'activité

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 46, *Information and documentation*, Subcommittee SC 11, *Archives/records management*.

This second edition of ISO/TS 16175-2 cancels and replaces ISO 16175-2:2011 and ISO 16175-3:2010, which have been technically revised. The main changes compared to the previous editions are as follows:

— functional requirements for software that were previously provided in ISO 16175-2:2011 and ISO 16175-3:2010 have been updated and consolidated;

— guidance on implementing software for digital records that was previously provided in all three parts of the previous edition of the ISO 16175 series has been updated and consolidated;

— in an updated form, some generic content on implementing records systems (both digital and analogue), that was previously provided in the now withdrawn ISO/TR 15489-2:2001 have been included.

A list of all parts in the ISO 16175 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

All organizations have at least one records system. Records systems are information systems which capture, manage and provide access to records over time. Records systems can consist of technical elements such as software, and non-technical elements such as policy, procedures and agents. Records systems as a whole include the policy, processes, software and people that use and manage records. Records systems exist in many variations: in paper systems, in software specifically designed to meet functionality for managing records, or as business software which capture and manage records. This document is focused on management of records in the digital environment, using software, but the general principles and considerations apply whatever the environment.

This document makes no distinction between software applications that are used for any business purpose and those applications specifically intended and designed to manage records. Examples of the former include Enterprise Content Management Systems and applications which create records as one part of their functionality such as Contracts Management Systems, Case Management Systems or transactional systems. The term used throughout is therefore “software for managing records”, which is intended to encapsulate the totality of applications that manage records as part of their usual functioning. It is assumed that almost all business applications generates data that is needed to serve as evidence of business activity for future reference and as such, among other things, need to create, store and manage records, whether within their own functionality or in combination with other applications.

Clauses 4 and 5 provide guidance on assessing the context of the organization and on scoping a project to implement software for managing records. Clauses 6 to 8 provide guidance on identifying requirements for the functionality of the software, including those for conversion and migration. Clause 9 provides guidance on communication, training and change management. Clause 10 provides guidelines for post-implementation review.

ISO 16175-1 provides a set of model functional requirements and associated guidance for software for managing digital records.

Information and documentation — Processes and functional requirements for software for managing records —

Part 2: Guidance for selecting, designing, implementing and maintaining software for managing records

1 Scope

This document provides guidance for decision making and processes associated with the selection, design, implementation and maintenance of software for managing records, according to the principles specified in ISO 15489-1.

This document is applicable to any kind of records system supported by software, including paper records managed by software, but is particularly focused on software for managing digital records.

This document provides guidance to records professionals charged with, or supporting the selection, design, implementation and maintenance of systems for managing records using a variety of software. It can also provide assistance to information technology professionals such as solution architects/designers, IT procurement decision makers, business analysts, business owners and software developers and testers seeking to understand records requirements.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 30300, *Information and documentation — Records management — Core concepts and vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 30300 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Assessing the organizational framework and context

4.1 General

Organizations have distinct cultures which usually affect their approach to managing records. These cultures are part of the organizational context. Factors that impact the information culture of an organization include:

— the values, attitudes and behaviours of organizational users;

— the technical environment; and

— the societal and organizational requirements, including legislation and/or regulation, standards and related policy containing requirements for managing records and outline compliance.

The organizational culture affects decisions on selection and implementation of systems and software for managing records. Where an organization has a defined information governance framework, the system for managing records should be integrated with the information governance framework.

Where software for managing records supports processes shared by multiple organizations, information culture factors should be considered for each organization. Selection and design of software for managing records should be responsive to the needs of each organization. Responsibility and ownership for managing cross-organizational systems and the rights in managing records created in such shared software environment should be clearly assigned.

Selection and design of software for managing records should be undertaken within an organizational framework that defines the policies and responsibilities to be implemented, and the records control elements needed to scope the project. The following aspects should be considered during the planning stages of any implementation:

— organizational records maturity;

— records controls;

— technical environment; and

— project scoping and resources.

4.2 Organizational records maturity

Assessing organizational records maturity helps guide the selection, design and implementation of software for managing records. Undertaking an assessment of organizational maturity enables benchmarking of progress over time, and assessment amongst similar organizations.

The following elements contribute to assessing organizational records maturity:

— whether strategic responsibilities for managing records are included in the senior management responsibilities;

— whether records and their management are considered explicit components of information governance;

— whether records functionality is included as a core component of the enterprise information architecture supporting technology development and deployment;

— the level at which responsibility is assigned to resource, enforce and monitor conformance with records principles;

— the availability of trained users and operational users in designing, implementing and maintaining software for managing records;

— the organizational culture and the extent of awareness of responsibilities for creating and managing records within the organization;

— what policies, standards and guidance outlining records responsibilities and obligations have been developed for the organization, whether they are current and whether they are compliant to the relevant jurisdiction;

— whether records requirements have been incorporated into information governance frameworks and all relevant organizational policies, standards and guidelines (for example privacy, information security, or disaster recovery);

— whether records have been linked to organizational and/or functional risk assessments;

— whether the key records controls are up to date and are available for use;

— what existing records systems are in place;

— links between existing records systems; and

— what support is available to users in understanding their records responsibilities.

4.3 Records controls

Records systems can be designed in many ways to support business, and more than one records system may exist within the organization as a whole. Records controls should be devised at an organizational level whenever possible, so that they can be applied consistently to all records without constraining the organization to using a single software application. These records controls identified in ISO 15489-1:2016, Clause 8, should be developed prior to the implementation of a specific software for managing records.

Records controls developed at organizational level can be used to develop more specific records controls that can be supported by software to manage records which operate at a smaller level – for example, controls applying to a part of the organization, or relating to a specific function. The organizational records controls can form the design template from which the specific elements particularly suited to the scope of the software implementation can be extracted, or developed in further detail if needed.

4.4 Technical environment

4.4.1 General

The following subclauses address common technical environments in which software for managing records are deployed.

4.4.2 Paper environment

Paper records systems are often organized into files which physically group documents representing organizational transactions together in ways that reflect their formation. Paper files are typically managed and accessed through registers and indexes that are often automated using software.

4.4.3 Digital environment

4.4.3.1 General

Many organizations now operate in a digital environment. While some paper records can still be created or received, these are converted to digital form using digitization processes and the digitized records are incorporated into the records system for processing. For guidance on digitization, see ISO/TR 13028.

In this environment, the main concern is to deploy software that supports the characteristics of authoritative records (that is, authenticity, reliability, integrity and useability). It is also usually important to enable the digital records (including their metadata) to persist beyond the lifetime of the software application in which they were initially managed. At the same time, the resources to support the management of digital records should be defined.

It is important that digital continuity be maintained. Software usually has a practical lifespan of about 5 to 10 years prior to major upgrade or replacement. Issues to be considered in addressing digital continuity include:

— data which need to be considered as a record may no longer be stored and accessible in recognized documentary form. Data fields in databases which provide evidence of transactions are records.

Such systems are often business applications which need to consider how to maintain the evidence of business. On some occasions, structured metadata defined for particular industries can inform the configuration of metadata elements. Key to considering implementation of records requirements in these environments is determining:

- what constitutes the evidence of the business;
- how to ensure that it is reproducible as presented to a user at a particular time;
- details of what changed; and
- when and who changed the data field contents.

This should be done using the process of appraisal. For further guidance on appraisal, see ISO/TR 21946.

— some business applications enable storage of documents within their software boundaries. Documents can be constantly changing, whereas records should be protected from unauthorised changes to ensure their evidential integrity.

— documents can be composed of data, which can be stored separately and represented as a single view (document) when required. The capacity to store data and disaggregated content separately, and both separate to the media, requires implementing records controls.

— workflow tools may be used to support authorizations and approvals. Such tools often utilize links and email notifications, and act as connectors between specific software. The workflow definitions themselves can be required as records, as can the results of those workflows – particularly approvals or authorizations.

All projects which seek to implement fundamental change from paper to digital should comprehensively understand the legislation, regulation and any rulings on:

— mechanisms for asserting authenticity, such as electronic signatures;

— requirements to define adequate processes to ensure the legal admissibility of digital copies of analogue records; and

— jurisdictional requirements to retain certain physical records after digitization.

4.4.3.2 Cloud computing environment

Cloud services are increasingly being used to provide storage and flexible access to software and digital records. Multiple options exist for procurement and deployment of cloud services. Options include software as a service, software with a browser-based user interface and storage of records in the cloud. For records, this “as a service” approach usually involves storage of digital records on servers external to the organization. As products emerge which are designed for the cloud environment, records software functionality is increasingly being made available as a service. At present this is typically access to a single proprietary set of functionality or software providing records functionality. Over time, it is anticipated that smaller and smaller bundles of functionality will be made available as services, allowing clever implementations to build the required records processes and functionality from multiple different service applications.

In this environment, in addition to the issues of authenticity and sustainability, organizations need to consider jurisdictional rules around data sovereignty, network security and developing adequate contractual and technical frameworks to guarantee an adequate level of service. Requirements relating to the end of the service and migration from one platform to another need to be addressed when initiaiting service agreements. Risk assessment tools supporting decisions on adopting cloud-based services are available in a number of jurisdictions.

4.4.3.3 Web-based collaborative software

Software for managing records can be available as web-based software which organizations deploy flexibly on demand as the organization size and requirements change. Such software can involve multiple agents, including those external to the organization – for example, suppliers or providers of services. Both parties use the same software to document transactions and communications. Considerations for records in this technology environment include the following.

— Who is responsible for managing authoritative records?

— Who owns the record?

— Who is the designated custodian of the system, to manage controls such as security permissions, access rights, etc.?

— Can the system support extraction of records that have to be incorporated into different organizational systems?

— What happens to the data at the end of contracts? Contracts may be for the software licence, for storage, for services or for the business activity.

As with cloud-based systems, issues around jurisdictional rules relating to data sovereignty, network security and adequate contractual and technical frameworks to guarantee adequate levels of service, should be considered.

4.4.4 Hybrid environment

Records are increasingly being "born digital". The option to print these documents to paper and return to the paper environment is sometimes advocated, as an interim stage on the way to more fully digital management environments. Where records are received in paper form but the organization's responses are created in digital form, the environment is known as "hybrid" – simultaneously containing both paper and digital records.

Different approaches to this complex environment exist. There are compromises in each approach which should be assessed against specific organizational needs. Approaches include the following.

— Maintaining separate systems for digital records and paper records (e.g. managing emails and their attachments in the mail system and managing paper files in another system). If possible uniform records controls such as business classification schemes should be standardized across the two technical environments to minimize the pain of a user having to access two or more discrete systems.

— Creating a "master" structure in the software which establishes unique logical containers referencing both digital and paper records with the location and format of the record referenced as a separate media type.

4.5 Project scoping and resources

Consideration of the issues discussed in 4.1 to 4.4 enable the project to be scoped. Software for managing records may be implemented to serve different requirements, varying from supporting records in specific business software, to software for managing records to support part or all of the organization. The boundaries of the project should be identified.

Initially, the project should define its boundaries in relation to the business.

— Will the software support the whole organization or parts of the organization? Specify which business functions, activities or organizational sections to be included in the project.

— Are the existing business processes to be automated, or is there opportunity to re-define business processes impacting records creation and maintenance?

— How is the software going to be used? For example will it be a standalone software, or will records be incorporated into an existing, or planned new, business system, or will an interface between specific software for managing records and business systems be used?

— Who will use and interact with the system? What constraints or opportunities does this present?

Once the boundaries have been established, knowledge of the business functions and activities undertaken by those areas within scope is essential. This involves:

— commencing an appraisal process with a scope defined by the project boundaries;

  See ISO/TR 21946 for guidance on records appraisal processes. If applicable, results of previous appraisal processes conducted within the organization may be reused.

— identifying existing business or software for managing records currently in use which may require integration, decommissioning or other design options to any new software being designed (see further Clause 6).

In defining the scope of a project, an initial assessment of resources and capacity which may affect the project should be undertaken. Where software for managing records are being assessed, these may include:

— **Business context:** Some organizations may be required to conform to strategic directions established by other parties, for example, government departments can be required to follow jurisdiction-wide rules. These strategic directions may impact options available for implementation. For example, a jurisdiction may require use of open source software or use of a private government cloud, or a management direction may already have established a "cloud-first" policy, or that existing platform software will be used, or a specific software may be dictated by other organizational purchases. Such management decisions frame what technology directions an organization can take, and in turn, may define the parameters in which implementation of software for managing records can take place.

— **IT Infrastructure and networks:** Software for managing records, especially those that incorporate digitized images, can be very resource intensive if the organization does not have the necessary infrastructure on networks to cope with the additional volume and size of information. Considerations include: network speed, bandwidth, storage capacity, resolution available on user screens, etc.

— **Software scalability:** Scalability is the capability of software, network, or process to handle a growing amount of work, or its potential to be enlarged in order to accommodate that growth. The extent to which software for managing records may need to "scale up" to larger, or organization-wide deployment needs to be considered and planned for at an early stage in the implementation of software, to meet organization's business needs. Business environments often change significantly during the development or life of specific records or business software. Software for managing records should be flexible to adjust the change of business needs and records requirements.

— **Software performance:** Software for managing records, like all technology systems, need to define appropriate software performance parameters. The most important indicators for performance are response time and data processing throughput speeds. It is expected that software will behave in a predictable manner when these variables change. Establishing appropriate software system performance criteria will define the necessary technology resources for performance-critical business processes to run smoothly. Performance criteria should be developed by taking into account the functional requirements and metadata requirements of records processes and records controls to meet organizational records requirements. (Further considerations are documented in ISO/TR 14105).

— **Budget:** All costs associated with implementing the software should be identified. This includes costs for selection and initial configuration, in addition to change management and training associated with initial implementation. Ongoing costs should be identified and assigned beyond a specific project budget allocation. These costs include ongoing training and support.