TECHNICAL SPECIFICATION

ISO/TS 16175-2

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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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Contents

Page

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.

— **Skill capability:** Implementing software for managing records involves:

— organizational capability and skills in relation to business analysis;

— understanding the organizational context and records maturity;

— identifying and assessing the available technology products;

— technical skills to implement and administer the software;

— specialist records skills to design and implement records controls within the software; and

— significant change management resources.

5 Determining a project methodology

5.1 General

Implementing a project to introduce software for managing records can be undertaken at different levels of complexity. An implementation methodology should be determined to suit the project scope and the scope of the software being implemented.

A project management methodology is commonly used to manage the project itself. The methodology chosen should be appropriate for the scope of the project. For further information, see ISO 21500.

Most organizations have a well-established preference for a particular project methodology.

Regardless of which technology implementation method is selected, each depends on significant amounts of prior work in:

— developing records controls (see ISO 15489-1);

— identifying configuration models (Clause 7); and

— defining training and change management needs (see Clauses 8 and 9)

See Annex A for further information on this topic.

5.2 Defining stakeholders

Implementing a software for managing records can involve many different professionals both internal and external to an organization. Identifying these stakeholders, their expectations, and determining their role is integral to successful implementation.

Internal stakeholders may include:

— project managers who may not always need specific records experience, but may specialize in project management itself;

— IT professionals who may be responsible for technical deployment of software, end-user assistance, etc.;

— senior management who are concerned with strategic direction, project progress against timelines, deliverables and budget;

— individual business unit managers who are required to assign user resources at particular stages of a project, for example when requiring business input into the design of the records controls, determining user requirements or when any technology implementation is affecting their business area;

— legal professionals who can be required to assist in contract negotiations as well as ensuring that legal requirements for the business are adequately met in the software; and

— user/business representatives who are required to interact with the software and be affected by its implementation.

External stakeholders may include:

— clients or customers who may be impacted by changed user experience and technology use;

— business service providers who may have their interaction with the organization changed;

— auditors or other professional service providers who may require independent access to systems; and

— external software vendors who may be involved in software development or configuration.

Strategies for engaging with stakeholders should be devised. These may include involvement in product selection, input into configuration decisions and user acceptance testing.

6 Determining and managing functional requirements

6.1 Developing functional requirements

Functional requirements specify the functionality that the selected software should provide. They describe what should be done at present and what developments are desirable into the future. Functional requirements should be developed, or selected, to reflect business activities and end-user services in addition to technical requirements, as a tool to evaluate and select technology. Work process analysis and business analysis may be required to establish the broader organizational functional requirements which are appropriate.

Functional requirements should be formally defined. They should include key records concepts and processes and may include technical requirements in terms of data, system performance, security and maintainability requirements for the system. All requirements should be defined at a level of detail which is sufficient for system design or selection to proceed. All requirements should be measurable and testable and closely linked to business needs and records requirements.

Defining the functional requirements for an organization should reference any jurisdictional work that has already been done which will minimize the time and effort required to develop organization-specific functional requirements. Where a jurisdiction has a product certification scheme for software for managing records,. an organization can assume that any certified software product will meet the claimed functional requirements. As organizations may have other requirements which need further configuration or additional software functionality, it may be necessary to ensure that the software still meets the certification criteria.

Selecting software that creates or manages digital records should be done in line with defined functional requirements. For a set of model and minimum functional requirements for managing digital records, including digital records in business systems, see ISO 16175-1.

6.2 Considerations for defining functional requirements

Software can be used to support records processes and principles in different ways. In some cases, functionality to manage records can be built into key business applications. Alternatively, independent software for managing records may be required in the organization. The type of software needed should be determined strategically and should be conformant with a broader enterprise information architecture.

Functional requirements should not only consider records specific requirements but also seek to assess:

— user interface or how the user experiences the software;

— capability of the software to interface or integrate with existing key organizational business software;

— capability to effectively manage import and export of records and metadata;

— capability to trace the development of the current state of the record over time, such as when it was changed, by whom, what was changed and previous values; and

— where the software is positioned in relation to market trends.

Functional requirements are usually rated by importance – for example, as mandatory, conditional or optional. The range, level of depth and level of obligation of functional requirements should be determined according to the organizational records requirements.

6.3 Managing functional requirements

In an organization, functional requirements for records may be formed as a standard, guidance or manual. It is possible to re-use already existing functional requirements for different types of software. Functional requirements can:

— be the source of criteria for evaluating software's capability to satisfy the organization's records requirement;

— contribute to development of use cases tailored to organizational requirements;

— contribute to development of test cases or test scripts against which to evaluate the software in demonstrations;

— contribute to the enterprise information architecture by providing a model that maps the strategy for implementation of software for managing records, including the migration paths and integration to existing software;

— be expressed as a report recommending overall software design components;

— identify future requirements to enhance interoperability between software; and

— identify implications for licensing and ongoing maintenance.

Functional requirements should be documented by records professionals and managed as a record and reviewed regularly. They should be used by records professionals, IT experts, technicians, and other stakeholders, in system design and implementation.

Staff with professional records skills may not have the words "records professional" in their job title. Specialist staff of this kind may have a wide variety of different job titles. Where organizations do not have records professionals on their staff it is strongly recommended that external consultants with professional records skills are engaged whenever organizations are embarking on projects to implement software for managing records.

7 Determining configuration

7.1 General

Software may be developed specifically to meet organizational requirements, or software which is available "off-the-shelf" can be used. Many implementations will use software available "off-the-shelf" which is then configured to reflect the records controls and business rules for records defined by the organization.

Configuration decisions affect how the records controls and other features will operate within the software for managing records.

Options for configuration can vary depending on the software implemented. Configuration decisions determine how the organizational records controls and business rules are to be operationalized within

the software for managing records. Configuration decisions may also affect whether software meets certification requirements relevant to the organization.

If the software for managing records is intended to be available more widely than its initial implementation, or if its scope of application is expanded in the future, then software should be designed to enable this scalability. By planning for the possibility of further implementation at the design stage, configuration decisions can be made that will enable expansion without compromising the original data and project scope.

7.2 Importance of documentation of configuration decisions

Information technology professionals have introduced the notion of configuration management to keep records of changes to configurations introduced over time. A configuration plan should define what specific decisions have been made at the initial implementation of the software for managing records and should track all changes and modifications to that configuration introduced to deal with particular requirements over time.

Knowing what the records controls and business rules are and how the software has been set up or configured is critical for:

— the user interface (what the user sees and how they interact with the software);

— standardization and consistency in applying rules;

— how the records controls and records requirements are implemented;

— identifying metadata dependencies (for example, when the population of a metadata element relies on information stored as a table elsewhere in the software);

— interoperability (which requires standard configuration to enable consistent metadata mapping between different software);

— business continuity and being able to recreate records controls in cases of software corruption; and

— defining appropriate import and export capabilities for the software at various stages in its life, but particularly to support migration.

7.3 Configuration decisions — Areas of configuration

7.3.1 General

"Off the shelf" software can come with a standard configuration, or require extensive set up and configuration. Configuration decisions are those that are required to establish the organizational controls and business rules. This is different to customisation which usually involves one-off programming to support functionality required by an organization. Every organization needs to do configuration in order to set up software for managing records. Each organization should determine its own requirements, bearing in mind that the more software is specifically tailored to organization, the more difficulties can be encountered in applying software upgrades.

Specific software comes with its own requirements for configuration. Where configuration decisions are required for software for managing records, these should be the responsibility of records professionals. While outsourcing of configuration decisions to implementation partners is commonly undertaken, the implementation decisions should be carefully reviewed and authorized by records professionals within the organization to ensure that the appropriate decisions are made for the organization and are consistent with professional best practice.

Records controls are instruments which should be developed to assist in meeting records requirements. Core records controls have been identified in ISO 15489-1:2016, Clause 8. Records controls include:

— metadata schemas for records;

— business classification schemas;

— access and permission rules; and

— disposition authorities.

Configuration should determine how the implementation supports all, or some, of the entities defined for managing records, which have been defined in ISO 23081-2. Different options are available in different software, so identifying how the software manages entities required for managing records is needed.

In particular, configuration decisions about the following records entities are needed:

— which entities will be managed within the software, and which by other organizational software;

— records aggregations: defining what records aggregations will be permitted or enabled by the software;

— agents (both internal and external users): how agents will be managed within the software;

— business processes: does the software assume that reflections of business process will be managed as a business classification scheme, or is there another way of defining this;

— the relationship between the entities (for example, which agents created which records using which business processes); and

— optionally, the entity "Mandates" can be configured to document the authority for records, how business processes operate (such as legislation, regulation or local business rules), or responsibilities of agents (such as delegations).

Typically, configuration is needed in the following areas:

— user interface;

— the degree of automation that will be supported;

— the use of workflow or other tools which enhance the routing of work through the organization;

— the automatic capture of records process metadata;

— integrations with other existing business software (if needed or cost effective); and

— application of records specific rules.

7.3.2 Records aggregation

In paper-based records systems, individual records are typically linked together and together the linked set of records creates a file which is then managed as an aggregation. Software for managing records often allows management of individual records (commonly referred to as documents in software). The definition of relationships between records then becomes a matter to be determined. Sometimes software reflects the hierarchical notions of a file or a folder. Software may not use the notion of fixed aggregation known to records professionals, but provide alternative mechanisms for grouping. Metadata tagging can enable many different ways of grouping records together. This needs configuration depending on the capabilities of the specific software. Critical for ensuring records that retain their core characteristics over time, is the ability to reconstruct linked actions and events.

Transactions within business software can be the record of action. How transactions are grouped into aggregations determines how adequately the accountable history of action can be traced. This may be done via many mechanisms, including common identifiers or linked transactions. If links are used, they should be persistent over time and potentially outside the software itself.

Determining how the specific software achieves appropriate grouping and aggregation, by fixing levels of aggregation (files, folders, case, etc.), by defining the depth of a hierarchy and/or other means, should be defined. Linked to aggregations should also be user permissions and functionality (see 7.3.7).

7.3.3 Agents (Users)

A common configuration decision involves how to manage users (a category of agents in ISO 23081-2) within the software. Options can include decisions on whether to integrate the software for managing records with other organizational software to manage users. Often this is an integration with tools such as organizational directory software, identity management software or authentication software providing single sign on permissions to a range of organizational software.

Most agents given permissions within the software are internal to an organization. Where software is shared beyond the organization, external agents may be given permissions within the software. Managing the registration and allocation of permissions to agents should be done according to a managed process and be monitored over time to ensure that permissions expire or are removed when appropriate.

In software for managing records, users need to be carefully managed to ensure that they are always linked to the appropriate organizational group, and that their roles are maintained over time – this means that once a user changes role within an organization, the software maintains the permissions and role that was current when they were creating and using records.

The management of data on individual users should link those individuals to the dates they were responsible for performing particular roles. This data should not be overwritten when the roles of individual users change. The users are often configured with their roles and permissions defined within the software for managing records itself, to ensure this link between the records, permissions and their current role.

7.3.4 Business process

Knowing what business was being undertaken at a certain point of time, by which user, is key to interpreting and understanding the records over time. Different software employs different means of capturing this type of information.

It can be inherited from linked software, for example, where the software for managing records is made interoperable with case management software, or financial management software. The module name of the linked software may define the business being done. A workflow which automates a particular process, for example, processing requests for approval for agents leave, may provide the appropriate business link.

Software specifically designed for managing records often uses a business classification scheme to provide this level of linkage to business, particularly when the business process itself is not inherently supported by the software for managing records.

Determining how the system captures some level of detail about what business action is being undertaken and how this is reflected in the software metadata are often a configuration decision.

7.3.5 Metadata schema for records

A metadata schema for records should always be maintained separately to the specific implementation to enable the particular configuration to be understood and consistency to be applied when defining how records are managed within multiple business software. A metadata schema defines key metadata elements for all entities included within the organization and should be used as a key source document for any configuration. A metadata schema will define mandatory metadata elements for each defined entity and it will also define specific encoding schemes relevant to particular metadata elements (for example, vocabulary controls to support identifying document or record types). For guidance on developing metadata schema for records, see ISO 23081-2 and ISO 15489-1:2016, 8.2.

While specific software may be able to manage metadata schema within their own discrete software, this does not negate the need for a separate metadata schema as records are created in multiple software. Defining how the software for managing records will use and deploy a metadata schema defined is a core component of configuration.

7.3.6 Business classification schemes

Business classification schemes are a method of linking records to the business being undertaken as the record is created. It is a core records control, particularly for paper-based records systems and software specifically designed for managing records. Business classification schemes are often applied as a way of defining hierarchies of records aggregations and ensuring consistency in naming. As discussed above, there are other options for identifying the business being done. Different software will use different methods to determine how to reflect the link to business which is critical to records integrity and interpretation. Business classification schemes can support the development and implementation of disposition authorities (see 7.3.8).

7.3.7 Access and permission rules

Not all records should be available to all users. Determining the required degree of security and access controls is specific to each organization and is a key records control. Business classification schemes may be used to help manage access and permission rules.

The existing access and permissions rules (see ISO 15489-1:2016, Clause 8) can be configured into software for managing records in many ways. The core of this is ensuring that the right users have been assigned permissions suited to their current role and that this is carefully managed as both roles and organizations change. How, and where, this is defined will be specific to each software application. Permissions are typically the ability to add record and/or records aggregations (that is folders, etc.), to change individual records, to restrict or permit others to see or work on records, to share outside the organization, or to delete records.

7.3.8 Disposition authorities

A disposition authority is a key records control which defines the range of processes associated with retention, destruction and/or transfer of records. Software implements this in many different ways. One of the most effective methods is to link this tool to a business classification scheme, so that a default disposal period is assigned from the authorized disposition authority when the record is created and assigned a business classification. Workflows defining an approval process for implementation of the provisions of the disposition authority can be configured. The rules for each organization should reflect the needs of that organization, so this is an area that should be configurable in an implementation.

7.3.9 User interface

Software for managing records should support configuration of the user interface. This determines what a particular user will see and how they will interact with the software itself. Views of the data can often be designed to support the business done by that user, by clever use of business classification and, access and permissions.

Different software has different capabilities to support how records are presented, through techniques such as portals, links to home pages, or short cuts devised to make interaction with the software as intuitive and non-invasive to working as possible. Designing and configuring good user interfaces to software for managing records and making them easy to use is a critical determinant in how well software will be accepted by end-users.

7.3.10 Supported automation

Associated with good end-user experience is the degree to which the software for managing records can be configured to support maximum automation, and where in the records processes this can be

introduced by the specific software. For example, maximizing automatic metadata capture on individual records will minimize the need for end-users to fill in templates with required records metadata.

Much of the metadata needed for records purposes can be automatically assigned through configuration, for example by linking users with business processes, by integration with records creating software, by inheriting metadata values from software defaults, etc. Defining how a specific implementation of software enables automation of various records processes is done during the configuration stage.

7.3.11 Supported automation tools

Many software for managing records products have integration to other supporting tools such as tools for workflow management. Workflow technology helps to route business actions to the next step in a work process. Closely aligned are tools that support approval processes.

Where workflow or other automation tools exist, these need to be configured to support the particular implementation and local work practices - for example, the routing of documents to a supervisor after an initial assessment process can be configured into an automated routine. Defining those routines should be based on a work process analysis (see ISO/TR 26122). Building these routines into the software is usually done during the configuration stage.

7.3.12 Automated capture of records process metadata

Records process metadata define the events and actions taken on the individual record and records aggregation. The records process metadata are clearly defined in standards (see ISO 23081-2). These requirements need to be identified early and techniques deployed to ensure that the appropriate event metadata are automatically created.

Many software applications consider this to be audit trail metadata. While there is a relationship, audits trails tend to record all events in a chronological log while records events need to be assigned to a specific entity or object. Records professionals should ensure that software manages records process metadata in ways that are appropriately linked to the specific entity and object, and which can be isolated for investigation when needed, for alerting inappropriate use/access, and for export at the end of software life.

7.3.13 Integration needed to other existing business software

Specific software designed to manage records can support other business applications. How the organization regards software for managing records in relation to the organization's enterprise architecture defines what integrations, interfaces or transfer procedures are appropriate to deploy between software. Software for managing records may interact with other business software using application programming interfaces (APIs), etc.

Determining what integrations are necessary, for example, essential to email applications, but not so essential to the financial management software, is part of the configuration as it is here that the decisions for integration are implemented.

Hardwired integrations using software to software metadata mapping is quite common, but care in defining these is needed, as they may have to be rebuilt continuously with each software upgrade. More flexible options in configuration for integration should be pursued.

7.3.14 Applicable records-specific rules

Many local business rules for records exist within each organization. These should already have been identified, or, if not, organizational practice should be defined. Determining how local rules will be implemented in the specific software for managing records is done at configuration. These include:

— Version control protocols (determining what, and how, versions will be identified and managed);

— Defining document types (for example minutes, forms, letters, etc.). Document types are common groups of records that have the same management requirements, or rules for version control, etc.;

— Naming conventions (for example, agreed use of abbreviations, control of synonyms, etc.);and

— Templates (identifying organizational templates and style sheets commonly used to produce various document types and enabling them to be invoked as appropriate within the software).

8 Determining requirements to migrate and convert records

Records migration is the movement, usually by replication, of data (including documents, records and metadata) from one instance of software to another. Records conversion is the process of altering a record's format. Common instances of migration and/or conversion include:

— Records may be migrated from one instance of software into another;

— Records may be migrated between an instance of software in one organization and the same, or a different, instance of software in another organization, (for example, when organizations restructure, or when a business function is transferred between one organization and another); and/or

— Records can be converted from one format to another for integration into the software, for example by digitization.

Those records that are part of a continuing business action are sometimes referred to as active records. Such active records should be migrated into any new system to enable the business action to continue, or alternative arrangements for continued access to the old system may be needed to enable the completion of the business action. Where records are deemed inactive, that is, when the initial business action required has been completed, the appraisal process will guide decision making about migration and/or conversion.

In some cases, older software will cease operations. Appraisal processes will define business needs for continuing access to records in older software and disposition rules will define which records need to be retained. Decisions about what records to leave in older software, and which records to migrate to new software is a core part of implementation planning.

If records are to be migrated from other software to the new software, this requirement needs to be carefully documented and planned. Planning for migration and /or conversion processes should include identification of location, volumes, classification schemes, metadata requirements, existence and location of duplicates, formats, information security requirements and retention periods.

Further guidance on conversion and migration is available in ISO 13008.

9 Communication, training and change management

9.1 General

ISO 15489-1 outlines the need for an organization to implement a training and change management readiness program for all agents who create records or use a records system. Such programs are required for on-going purposes, but are also essential to support implementation of software for managing records. The success or failure of a software implementation is often dependent upon the user acceptance of new technologies and resulting changes in ways of doing their work.

The training and readiness for change management programs should ensure that the functions and benefits of managing records are widely understood in an organization. In addition to specific training on operating a technology based system, such training provides an opportunity to reinforce organizational knowledge about records policies, procedures and processes, giving agents an appreciation of why they are required. Training will be most effective when it is tailored to the needs of particular groups of agents, or in some cases, individual agents.

9.2   Communications

Implementing software for managing records changes the way people undertake their day to day work. Strong, effective and clearly defined communications outlining intentions, progress and expected timelines for software implementation project can engage end-users and assist in acceptance of change.

Different communications styles may be adopted to different stakeholder groups, and stakeholder groups may be engaged at different points in the project implementation. Timely communication should be devised to inform those affected about when to expect change.

9.3   Training program requirements

An organization should assign responsibility for implementing and managing its records training and change management program to a manager at a suitable level and should resource the program adequately.

The purposes and benefits of attending training include the following:

— to enable agents to competently operate any software used in undertaking their work;

— to make agents aware of changes, threats and risks and how to work to prevent them;

— to build awareness that records quality assurance and cyber security are more than just concerns for the IT department;

— to understand the legal and policy context of records quality assurance roles;

— to protect the organization and its records assets;

— to enable all agents to be accountable for requirements, policies, practices, roles and responsibilities for managing records;

— to enable creation, capture and management records to be built into daily operation and business;

— to understand best practice and case studies from other organizations; and

— to support organizational learning.

An organization may choose to use a third party supplier to provide some or all of its records training.

A formal training program should be linked to organizational policies and procedures to ensure management commitment to the program.

The training program should be ongoing and include training on requirements, policies, practices, change management roles and responsibilities for managing records as core competence for all agents.

Training on creation, capture and management of records should be built into existing training programs in relation to daily operations where possible and include all involved in management of records.

The training can be delivered in various ways and can be incorporated into existing programs. In all options, training should be supported and promoted by senior managers.

9.4   Change management readiness

To implement effective change management, the following steps may apply.

— Gathering data and assessment of major changes specific to records system implementation. For example:

   — changes in the way the business create records;

— changes regarding the ownership of records;

— changes regarding the operational policy and process;

— changes regarding the technology that supports the management of records;

— changes regarding the way records are managed; and

— changes on how agents need to understand records, and how to trust records.

— Identify areas of change and ensure that they are planned for and incorporated into the change management program supporting a software implementation project. For example:

— disposition authorities are being reviewed and updated;

— the retention period associated with various records are updated;

— related metadata schema are reviewed and updated;

— technology configurations and settings are changed; and

— inform users of changes and offer training if required.

— Designate changes controls which ensure that changes are introduced in a controlled and coordinated way, review and approve the change management program, conduct change control assessment, and review authorization for changes. For example:

— update the records metadata schema making it mandatory for users to populate certain metadata fields.

— reconfigure the software for managing records to ensure it can capture and manage any new metadata required; and

— train users on the new records system.

— Devise strategies to support software roll out (where necessary), which may include:

— nominating specific key users to be a point of contact for assistance;

— scheduling regular "help" sessions in workplaces; and

— floor walking by functional experts to support individual users.

— Evaluate and report the impact of a change management program and give feedback to update training.

— Reflect and adjust knowledge and skills to create adaptable agents.

9.5   Evaluation and review

This includes evaluation and review of training methods, communications, benefits and change management readiness.

Evaluation of the program is based on subsequent successful operation of the implemented software. This may require assessment of individual performance measurement against the level of training undertaken, and operational audits of the software in business unit, or across the organization. The program may also monitor and record agent's skills levels against the requirements set out in the training program.

The effectiveness and efficiency of the records training, communication and readiness for a change management program will be enhanced if they are regularly reviewed and reports provided to senior management through the organization's usual channels.

The level of trainee satisfaction with courses and other activities provided should also be assessed.

It is important that the result of evaluation and review of training programs are followed by any necessary adjustments to the programs, and that updates are provided to those already trained.

10 Post-implementation review, monitoring and assessment

10.1 Post-implementation review

Evaluation of implementation through post implementation review, monitoring and assessment of the operation of the software for managing records are key components of a successful project. Resources should be assigned beyond the immediate scope of the implementation to enable these processes to be undertaken.

All software implementation projects should be reviewed after completion to assess the success, or any shortcomings of the implementation. Such reviews aim to identify what could be done better, what problems remain after the implementation is complete, and any improvements which remain to be implemented after the formal project closure.

The review process performs an analysis, comparing the software for managing records with the functional requirements as an established benchmark. When undertaking the review, it is important to consider the broader system environment including business rules, processes and related physical or digital systems, not just software functionality, as some records requirements may be satisfied via supporting infrastructure mechanisms rather than by the software itself.

All findings from the post implementation review should provide feedback into the next iteration of the design stage for implementation.

Post implementation reviews for software for managing records can be helpful if done at different intervals. These may be:

— immediately after the implementation of a records system;

— after a defined period of operation; and

— after a significant change to the records system.

10.2 Monitoring

Monitoring is a continuous process of assessing the functionality of software for managing records and a way to identify success, problems or deficiencies in software. Monitoring can be undertaken at two levels:

1) Monitoring as a routine part of the overall records program. This type of monitoring is based on an existing records policy. Monitoring involves the assessment of a records system against requirements of the existing policy and the determination of the compliance of the system with meeting policy requirements.

2) Monitoring the ongoing software upgrade, including:

— upgrade from physical (manual) records system to software for managing records;

— upgrade between versions of a software system; and

— upgrade from one application to another.

The monitoring during software upgrade should cover all the stages of software implementation (planning, designing, installation, use, etc.). Any phase of the software implementation should have key performance indicators (KPIs) that provide an indication of the success of each phase of software upgrade.