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

**Part 1:  
Functional requirements and  
associated guidance for any  
applications that manage digital  
records**

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

*Partie 1: Exigences fonctionnelles et recommandations associées pour  
toute application de gestion de documents d'activité numériques*



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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](http://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](http://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 on 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 the following URL: [www.iso.org/iso/foreword.html](http://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 cancels and replaces the first edition (ISO 16175-1:2010), which has been technically revised. The main changes compared to the previous edition are as follows.

- The distinction between dedicated records management applications and business applications has been dispensed with. As a result, a single set of functional requirements and associated guidance is provided in a single document that addresses both kinds of software applications.
- The number of functional requirements has been greatly reduced and simplified in order to help users focus on the most important areas of software functionality.
- Text has been updated, clarified and simplified, with the use of records jargon eliminated where possible and explained when necessary in acknowledgement of the primary audience for the standard being IT professionals. More diagrams have been added.

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](http://www.iso.org/members.html).

## Introduction

### 0.1 Case for management of records

Good management of records and information is fundamental to a well-functioning organization. It supports business functions and processes and provides a basis for efficient service delivery. It also provides the mechanism for organizations to retain evidence of their decisions and actions for future reference and to support business continuity. Good records practice is simply good business practice.

Managing records facilitates:

- a) efficiency, by making information readily available when needed for decision-making and operational purposes and to support information reuse and innovation;
- b) sound use of financial resources, by allowing timely disposition of non-current records;
- c) accountability, by enabling the creation of complete and authoritative records of business functions and processes;
- d) compliance, by demonstrating that legal requirements have been met; and
- e) risk mitigation, by managing the risks associated with unlawful loss or destruction of records and with over-retention of records, and risks resulting from inappropriate or unauthorized access to records.

In most organizations today, business is transacted and enabled by a variety of software applications. If organizations are to capture and manage reliable records of their business functions and processes, it is vital that their line-of-business applications incorporate good records functionality as part of their design. Making, keeping and disposing of records should be an organic and natural part of business processes.

### 0.2 Purpose of this document

This document provides model, high-level functional requirements, with associated explanatory information and usage guidance, for any software applications that are intended to manage digital records. ISO/TS 16175-2:—<sup>1)</sup> provides guidance on how to select/design, implement and maintain software for managing records within organizations.

For the purpose of presenting model functional requirements, 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 “Business application”, 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 will generate data that is needed to serve as evidence of business functions and processes for future reference and as such will, among other things, need to create, store and manage records. The purpose of this document is to assist the developers and implementers of those applications to identify and deploy functional requirements that helps ensure that the data generated and held in such applications can serve as adequate records of business functions and processes.

In addition to providing model high-level functional records requirements in business applications, this document provides guidance on identifying and addressing the needs for records. It aims to:

- a) help organizations understand requirements for managing digital records as they relate to software applications used by organizations;
- b) assist IT and business specialists to include records considerations in applications design and/or procurement; and

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1) Under development. Stage at the time of publication: ISO/DTS 16175-2:2020.

- c) assess the capabilities of existing business applications to manage records, including helping to identify gaps or areas of risk in the current functionality of those applications.

This document is part of a suite of records system implementation guidance that supports the core international records management standard, ISO 15489-1, where utility and characteristics of records systems are explained.

### 0.3 Audience

The primary audience for this document are professionals responsible for designing, developing, procuring, reviewing and/or implementing software applications, such as business analysts, applications developers, solution architects and IT procurement decision-makers. The audience also includes records professionals who are involved in advising or assisting in such processes.

Role	Purpose
Solution architects/designers	Ensure IT applications infrastructure supports the records requirements.
Records professionals	Advising and assisting the business in defining records requirements.
IT procurement decision-makers	Ensure procurement processes meet these requirements.
Applications developers	Build applications and support information systems testers during functional specification development and test phase. Includes software vendors and developers who wish to incorporate records functionality within their products, both commercial or open source.
Business analysts	Develop technical specifications; initiate/collate feedback and walkthrough. Submit specification for sign-off and pass over to developer. Update any changes to specification after sign-off (e.g. changes that are agreed during test phase), if required.
Applications testers	Develop test plans, test conditions/cases and execute tests. Analyse test results, log any failures and retest once immutability has been applied and built to test environment.
Business owners	For solution-specific requirements. Review and confirm application requirements that meet business objectives. Provide the business rules/processes/requirements to the business analyst during the software specification development and test phases.

Given the target audience for this document, the use of terminology that is specific to records professionals has been minimised as far as possible. Where the use of such terminology is unavoidable, it is explained and/or defined (in [Clause 3](#)).

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

## Part 1:

# Functional requirements and associated guidance for any applications that manage digital records

## 1 Scope

This document provides model, high-level functional requirements and associated guidance for software applications that are intended to manage digital records (including digital copies of analogue source records), either as the main purpose of the application or as a part of an application that is primarily intended to enable other business functions and processes.

It does not include:

- functional requirements for applications that manage analogue records;
- generic design requirements such as reporting, application administration and performance;
- requirements for the long-term preservation of digital records in a dedicated preservation environment;

**NOTE** The model requirements are intended to encourage the deployment of applications that do not hinder long-term preservation of records. As such, some of the requirements support long-term digital preservation outcomes.

- implementation guidance for applications that manages analogue and/or digital records. Such guidance can be found in ISO/TS 16175-2:—<sup>2)</sup>.

## 2 Normative references

The following document is referred to in the text in such a way that some or all of its 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>

2) Under development. Stage at the time of publication: ISO/DTS 16175-2:2020.

## 4 Key outcome areas and configuration options

### 4.1 Key outcome areas

The functional requirements in this document focus on the outcomes required to ensure records are managed appropriately. How to achieve the outcomes will depend on the type of application being used. See [Figure 1](#).

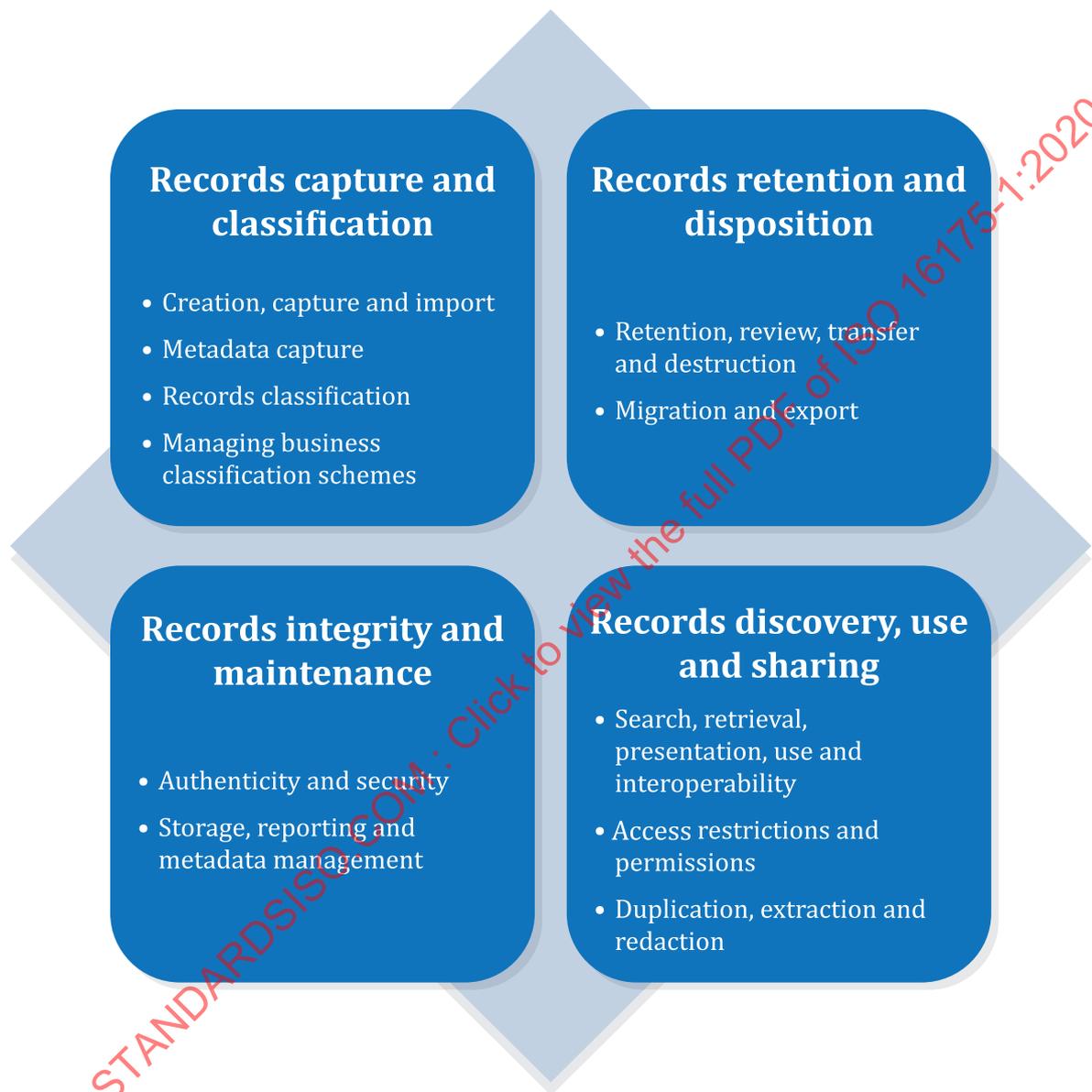


Figure 1 — Key outcome areas

### 4.2 Key outcome areas in detail

#### 4.2.1 Records capture and classification

Software applications that enable business activities or transactions should be able to capture and/or import/ingest evidence of those activities. This involves identifying sets of digital information to serve as records. Records shall be linked to their business context using metadata.

#### 4.2.2 Records retention and disposition

Records shall be kept and remain accessible to authorized agents for as long as required for legislative, community and business needs. In conformance with authorized disposition authorities, records should be retained and disposed of in a managed, systematic and auditable way.

#### 4.2.3 Records integrity and maintenance

Business applications should be able to register any interactions with or changes to the records. Metadata recording these interactions and changes should include the name of the responsible agent, a timestamp and details of any changes. The metadata should be persistently linked to the records for as long as they exist.

#### 4.2.4 Records discovery, use and sharing

Business applications should enable searching, retrieval, rendering, use, sharing and redaction of records for authorized agents. They should also support interoperability across platforms and domains and over time.

NOTE See [7.5.5](#) for a discussion on redaction of records.

### 4.3 Possible configuration options for managing records created in business applications

It is not necessary for all the functional requirements presented in this document to be met by a single software application. It may be more cost effective for the requirements to be satisfied by multiple software applications that collectively work together within an organization, or across multiple organizations, to enable the conduct of business. Guidance on these issues can be found in [Figure 2](#) and in [7.5](#). In addition, some requirements could be satisfied outside applications through processes and procedures.

Before using the functional requirements, organizations should consider how to meet these requirements: through internal mechanisms within a business application itself, or by interacting with external software applications that are capable of providing the necessary records management functionality.

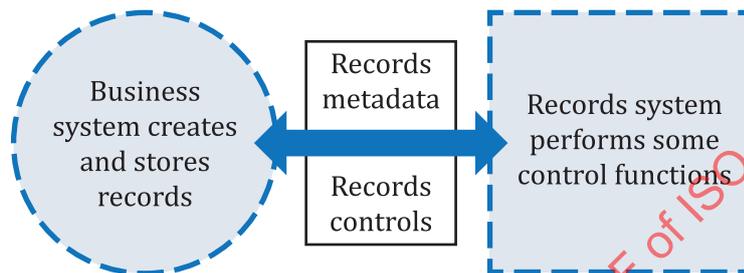
The mandatory functional requirements in this document outline the core records processes that shall be addressed. Options to implement these requirements may include:

- a) designing the business application to internally perform the records processes, or to do so in combination with associated work processes;
- b) integrating with a dedicated records management application, such as an electronic records management system (ERMS); or
- c) designing export functionality into the business application to directly export records and their associated metadata to an identified records management application.

1. Records managed **WITHIN** the business system



2. **INTEGRATION** with a records system



3. **EXPORT** of records to a records system

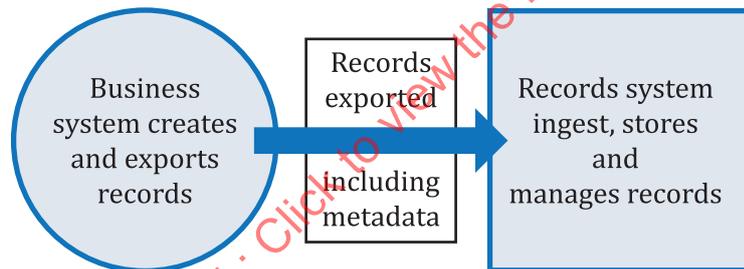


Figure 2 — Possible configuration options for managing records created in business applications

For more detail, see [8.6](#).

## 5 High-level requirements for software managing digital records

### 5.1 General

Organizations make decisions on what type of software for managing records should support particular business processes, business units or the organization as a whole and consider the risks that are linked to business processes when making such decisions. The scope of software for managing records will be affected by the social and regulatory framework within which an organization operates, by the organizational readiness or maturity around records reflected in its policies and allocation of responsibilities, and by the technologies that are appropriate for organizational use.

Organizations that already rely on digital records to conduct and document business, or that are interested in eliminating paper records from their operations, are seeking solutions to the issues arising from management of digital records. The decisions that organizations make today about the capability of the software, and the arrangement and structure of information within the software will have a significant impact on the long-term sustainability of digital records. The capacity to sustain digital records beyond the lifespan of a single instance of software is closely linked to the design, selection and

configuration of software, and should be considered carefully within an organization-wide information governance context.

Organizations deploy software applications to automate business activities and transactions. The digital information generated by an application may serve as the only evidence or record of the activity or transaction, despite the application not being designed specifically for the purpose of managing records. Without evidence of these activities, organizations are exposed to risk and may be unable to meet legislative, accountability, business and community expectations. Because of the dynamic and manipulable nature of business applications, the capture of records and the ongoing management of their fixity, authenticity, reliability, usability and integrity can be challenging.

Many business applications generate and store data that can be subject to constant updating (dynamic), able to be transformed (manipulable) and only contain current data (non-redundant). While business requirements for dynamic, manipulable and non-redundant data can be entirely legitimate, if records are to serve as reliable evidence of business functions and processes, they need to be fixed and inviolable. That is, systems and processes need to be able to guarantee the reliability, integrity and authenticity of the records as evidence of past business activities and as business assets.

For the purposes of this document, the characteristics of authoritative records (as defined in ISO 15489-1:2016, 5.2.2) may be applied to any and all data, documents or information. A records approach enables the traceability of actions documenting business to be maintained for as long as needed to support assertions of authenticity, reliability and integrity.

## 5.2 Assumptions

This document assumes

- that records controls (particularly those identified in [Clause 8](#)) are already developed within the organization;
- that projects to implement records requirements in software will be continuous; and
- that all new software implementation projects require implementation of defined records requirements.

Designing, implementing and maintaining software for managing records is an ongoing and continual part of managing records within organizations, to reflect constantly changing technological environments, new business software, and changes to business processes.

## 5.3 General overview of requirements

Selecting software that creates or manages digital records should be done in line with defined functional requirements. The high-level requirements included here are consistent with the principles for managing records outlined in ISO 15489-1:2016, Clause 4. [Clause 6](#) provides more detailed functional requirements for software that creates or manages digital records.

- a) Software should support the management of digital records as a core component of the business process.

When automating a business process, records requirements should be met by software.

- b) Software managing digital records should maintain persistent links to the business context.

An understanding of the business context of records is required to enable accurate interpretation of their content. Software should persistently link to the specific business context in which records are created and maintain that linkage over time.

- c) Software managing digital records should be able to capture metadata, automatically generated to the greatest extent possible.

Software should be designed and implemented in a manner that allows maximum automatic assignment of point of capture records metadata, enabling end-user editing capability prior to capture, where needed. Records process metadata should be automatically generated and captured as the system is used.

- d) Software should be user-friendly and allow easy records creation and capture.

Software that automates management of records should be designed in a way that makes such activity largely "invisible" to the end-users. Techniques for this may include automatic logging of events occurring on records at all levels of aggregation and minimizing end-user requirements to interact with complex functionality specific to requirements of records professionals.

- e) Software should support interoperability over time and across platforms and domains.

Digital records often have operational or legal requirements for retention over periods of time that may exceed the lifespan of the hardware or software that created it. Software should be able to present records in a manner that maintains their metadata, usability and enables them to be converted to new formats and/or migrated to other technology platforms.

- f) Software should have the capacity for bulk import and export.

Records often need to last longer than the system in which they are initially created, captured and managed. Records software should incorporate capabilities for bulk re-formatting as part of import (ingest) or export capability or, at a minimum, via non-proprietary encoding of record metadata.

- g) Software should maintain records in a secure environment.

Software should not allow unauthorized access or modifications to any records or to records metadata. Where authorized modifications are performed, they should be fully documented. Information which is confidential or which contains personal information should be identified and mechanisms deployed to ensure appropriate access and use protections.

- h) Software should support the disposition of records in a managed, systematic and auditable way.

Software needs to be able to dispose of records in a systematic and auditable way in line with business or legal requirements and societal and community expectations.

- i) Software should rely as much as possible on open, robust and technology neutral standards.

Many software products that create or manage records are developed using proprietary code. Hardware or software dependencies can have adverse effects on access and preservation of records in the long term. Open, robust and technology neutral standards should be used.

## 6 Model functional requirements for applications that manage digital records

### 6.1 Requirements groupings

NOTE See [6.3](#).

#### R1. Capture and classification

- R1.1. Records creation, capture and import
- R1.2. Records metadata capture
- R1.3. Records classification
- R1.4. Managing business classification schemes

## R2. Retention and disposition

- R2.1. Records retention, review, transfer and destruction
- R2.2. Records migration and export

## R3. Integrity and maintenance

- R3.1. Records authentication and security
- R3.2. Storage, reporting and metadata management

## R4. Discovery, use and sharing

- R4.1. Search, retrieval, presentation, use and interoperability
- R4.2. Access restrictions and permissions
- R4.3. Duplication, extraction and redaction

## 6.2 Obligation levels and extensibility of requirements

The obligation levels provided for each requirement indicate the relative importance of the requirement in question. The words “shall”, “should” and “may” are to be interpreted as follows:

Shall	Requirement that use “shall” are mandatory for applications intended to conform with this document.
Should	Requirements that use “should” are highly desirable but not mandatory. They may be ignored if a valid reason exists, but the full implications of ignoring the requirement should be understood and carefully considered before choosing a different course.
May	Requirements that use “may” are optional.

The model requirements presented in [6.3](#) may be added to or extended in particular implementation settings depending on the circumstances and records requirements that apply in those settings. Such additions and extensions shall not, however, contradict any of the model requirements presented in [6.3](#).

## 6.3 Requirements in detail

These requirements can be met by more than one configuration option, see [Figure 2](#). As far as possible, this subclause aims to avoid the use of records jargon. Definitions for records terminology that is used can be found in ISO 30300. Discussion of the utility of many of these concepts can be found in [Clause 7](#).

<b>R1. Capture and classification</b>	<b>Obligation</b>
<b>R1.1 Records creation, capture and import</b>	
The business application shall, either alone or in conjunction with other applications:	Shall
R1.1.1 enable the capture of records and any associated records metadata;	
R1.1.2 where an individual business application cannot provide the capability to ingest records and associated metadata, other components shall provide the capability to ingest records and/or associated metadata from other business applications or related external repositories, see options 2 and 3 in <a href="#">Figure 2</a> ;	
R1.1.3 where the application creates or receives records generated by electronic messaging systems (such as email, text messaging and instant messaging), capture attachments and embedded objects together with the digital messages as either linked records or as a single compound record;	

<p>R1.1.4 enable the business application to import digital records and associated metadata directly from an external business application, either in bulk or individually, ensuring the integrity of the content and structure of the records. When the records that are to be captured have additional integrity verification criteria (electronic signatures, checksum, etc.), the system that captures them shall be able to verify the validity according to these criteria, at least at the time of capture.</p>	
<p>The business application should, either alone or in conjunction with other applications: R1.1.5 support capture of records in commonly used file formats and/or in their native formats.</p>	Should
<p><b>R1.2 Records metadata capture</b></p>	
<p>The business application shall, either alone or in conjunction with other applications: R1.2.1 enable the capture and maintenance of metadata for records at any time during the record's existence, in accordance with one or more pre-determined metadata schemas; R1.2.2 be able to assign and persistently link unique identifiers to each record and records aggregation; R1.2.3 support the ability to automatically detect and capture pre-existing metadata for records from business processes and associated information systems; R1.2.4 be able to capture metadata entered manually by an agent.</p>	Shall
<p>The business application should, either alone or in conjunction with other applications: R1.2.5 be able to validate metadata values against pre-determined schemes and/or syntactical standards; R1.2.6 support common business formats (e.g. XML) or combinations of formats for metadata elements/properties; R1.2.7 be able to capture and persistently link workflow processes associated with records, including approvals.</p>	Should
<p>The business application may, either alone or in conjunction with other applications: R1.2.8 allow authorized agents to add annotations or notes to records as linked metadata in accordance with business rules and policies (e.g. authorized agents may include persons who are the subject of records).</p>	May
<p><b>R1.3 Records classification</b></p>	
<p>The business application shall, either alone or in conjunction with other applications: R1.3.1 be able to associate records at individual object and/or aggregation level to their business context; R1.3.2 support documentation of changes to business context over time, retaining the ability to link business context accurately over time.</p>	Shall
<p><b>R1.4 Managing business classification schemes</b></p>	
<p>The business application may, either alone or in conjunction with other applications: R1.4.1 manage and maintain an approved business classification scheme.</p>	May

R2. Retention and disposition	Obligation
<b>R2.1 Records retention, review, transfer and destruction</b>	
<p>The business application shall, either alone or in conjunction with other applications:</p> <p>R2.1.1 be able to allocate an appropriate retention and disposition period in the application for every record and record aggregation and also allow the updating of these retention and disposition periods if necessary, because of changing legal or business requirements;</p> <p>R2.1.2 retain key metadata (as stipulated by relevant local/jurisdictional standards), including metadata documenting disposition authorization, for the record and/or aggregation following disposition of the record and/or aggregation;</p> <p>R2.1.3 store the status of the record (and/or records aggregation) as 'Deleted' or 'Transferred to X' from the date of record disposition;</p> <p>R2.1.4 have the ability to pause disposition, preventing records from being disposed of;</p> <p>R2.1.5 report on disposition status and activity when records disposition is carried out within the application;</p> <p>R2.1.6 if required by a disposition authority, ensure that the destruction of records results in the complete obliteration or inaccessibility of the contents of all records (including all components of each record and any backup copies) as authorized, and that they cannot be restored through operating system features or specialist data recovery techniques;</p> <p>R2.1.7 support the capability to transfer records of continuing value together with their metadata to an in-house organization's archive or to an authorized third-party archiving service.</p>	Shall
<p>The business application should, either alone or in conjunction with other applications:</p> <p>R2.1.8 automatically flag records as eligible for disposition and dispose of them once their retention periods have expired and, if required by a disposition authority, the records have been reviewed by an authorized agent/user;</p> <p>R2.1.9 restrict the operation of disposition to a business application administrator; support a range of disposition triggers. For example:</p> <ul style="list-style-type: none"> <li>— date of record creation;</li> <li>— date of last retrieval of a record;</li> <li>— opening or closing date of an aggregation of records (where applicable);</li> <li>— date of demolition of a building, where records relating to the building are to be retained for the life of the building;</li> <li>— date of last review of a record or aggregation of records.</li> </ul>	Should

<b>R2.2 Records, migration and export</b>	
<p>The business application shall, either alone or in conjunction with other applications:</p> <p>R2.2.1 be able to migrate/export records and associated metadata, and where applicable aggregations of records, to:</p> <ul style="list-style-type: none"> <li>— a more appropriate or up to date file format for the records to support ongoing retention and use;</li> <li>— another business application within the organization;</li> <li>— a replacement business application when the source application is due for decommissioning; and/or</li> <li>— a system in a different organization;</li> </ul> <p>R2.2.2 ensure that any migration/export action is able to include:</p> <ul style="list-style-type: none"> <li>— all records, and where applicable aggregations of records;</li> <li>— metadata associated with exported records and aggregations of records; and</li> <li>— event history metadata associated with exported records;</li> </ul> <p>R2.2.3 be able to migrate/export digital records, and where applicable aggregations of records such that:</p> <ul style="list-style-type: none"> <li>— the content and structure of records and aggregations of records are not degraded;</li> <li>— associations are retained between exported records and their associated metadata; and</li> <li>— relationships are maintained between exported components of a record, between exported records, and where applicable aggregations of records, so that their structural links can be re-built in the receiving application;</li> </ul> <p>R2.2.4 be able to test and verify that the migration or export has not degraded the integrity of the records and key metadata below the minimum standards set by the business and/or jurisdiction;</p> <p>R2.2.5 allow records to be migrated/exported more than once.</p>	<p>Shall</p>
<p>The business application should, either alone or in conjunction with other applications:</p> <p>R2.2.6 be able to implement the destruction of source records after their successful migration/export to the new application;</p> <p>R2.2.7 be designed in such a way that authorized agents are able to access the underlying data tables and content of the application following its decommissioning, via a viewer or using virtualization technology, where inactive/closed records are only required for short-term retention and therefore not to be migrated;</p> <p>R2.2.8 support content access control for records applied at record level and persistence of that control when content is exported/transmitted/migrated from the host application.</p>	<p>Should</p>

<b>R3 Integrity and maintenance</b>	<b>Obligation</b>
<b>R3.1 Records integrity and security</b>	
<p>The business application shall, either alone or in conjunction with other applications:</p> <p>R3.1.1 ensure that the content of records can be fixed or protected from unauthorized alteration</p> <p>enable controls over the alteration or editing of metadata in accordance with business rules stipulated by the organization;</p> <p>R3.1.2 be able to generate checksums or hashes, or implement other mechanisms to support integrity checking at points in time;</p> <p>R3.1.3 routinely authenticate any user before allowing access if records require a certain level of permission to allow access;</p> <p>R3.1.4 automatically capture and show the details of all authentication and security-related operations.</p>	Shall
<p>The business application should, either alone or in conjunction with other applications:</p> <p>R3.1.5 be able to capture and persistently store metadata that documents the use of digital signatures (date, time and validation) with the record;</p> <p>R3.1.6 capture any other confirmation details for digital signatures in such a way that they can be retrieved with the record, but without compromising the integrity of a private key;</p> <p>R3.1.7 support the secure transmission of records, including the encryption of records for secure transmission where appropriate.</p>	Should
<b>R3.2 Storage, reporting and metadata management</b>	
<p>The business application shall, either alone or in conjunction with other applications:</p> <p>R3.2.1 ensure that the records and associated metadata controlled by the application are persistently and securely stored and that they remain accessible and retrievable over time for their minimum retention periods to authorized agents;</p> <p>R3.2.2 be able to produce reports on records capture, usage and disposition;</p> <p>R3.2.3 be able to report the actions carried out on records, either by the application itself or by authorized agents and administrators.</p>	Shall
<p>The business application should, either alone or in conjunction with other applications:</p> <p>R3.2.4 be able to manage, maintain and/or link to approved metadata profiles or schemas over time in ways that support the automated capture and maintenance of validated metadata values for records and records aggregations.</p>	Should
<b>R4. Discovery, use and sharing</b>	<b>Obligation</b>
<b>R4.1 Search, retrieval, presentation, use and interoperability</b>	
<p>The business application shall, either alone or in conjunction with other applications:</p> <p>R4.1.1 provide agents with tools for searching and retrieving records and metadata;</p> <p>R4.1.2 extract and render records in a usable format;</p> <p>R4.1.3 be able to integrate and interoperate with other information systems which have the appropriate functionality where the business application is itself unable to undertake records processes.</p>	Shall

<p>The business application may, either alone or in conjunction with other applications:</p> <p>R4.1.4 support use by mobile devices;</p> <p>R4.1.5 allow agents to configure the application for personalized records views, searches or presentation services;</p> <p>R4.1.6 allow for collaboration with external third parties and for the sharing of records and/or metadata with external platforms, networks, services and collaborative workspaces;</p> <p>R4.1.7 be able to make approved data stored within the application available for harvesting by external services and applications as linked open data via an application protocol interface using protocols such as OAI-PMH or CMIS.</p>	<p>May</p>
<p><b>R4.2 Access restrictions and permissions</b></p>	
<p>The business application shall, either alone or in conjunction with other applications:</p> <p>R4.2.1 apply security and access restrictions ensuring that only authorized agents can access records appropriate to their access rights;</p> <p>R4.2.2 apply security and access protocols to protect the content of records and their metadata from unauthorized access, alteration or destruction;</p> <p>R4.2.3 create and maintain access, usage and security metadata, generating secure event logs for each specific record/record aggregation documenting access to and use of records.</p>	<p>Shall</p>
<p><b>R4.3 Duplication, extraction and redaction</b></p>	
<p>The business application shall, either alone or in conjunction with other applications:</p> <p>R4.3.1 support mechanisms to enable the authorized duplication of records or extracts of records for use either within the application itself or in other applications and/or organizations, in accordance with pre-determined business rules.</p>	<p>Shall</p>
<p>The business application should, either alone or in conjunction with other applications:</p> <p>R4.3.2 allow the creation of an extract from a record, whereby sensitive information is removed or hidden from view in the extract, while the originating record remains intact, ensuring metadata documenting the extraction action are generated and captured.</p>	<p>Should</p>

## 7 Understanding the model functional requirements

### 7.1 General

The model functional requirements presented in this document can be used by organizations for a number of purposes. These include:

- developing requirements for functionality for records to be included in a design specification and for evaluation purposes when building, upgrading or purchasing business software; and
- reviewing the functionality for records or assessing the conformity of existing applications.

Before deploying the functional requirements set, organizations should identify their records requirements and how records will be managed and then adapt the model requirements to meet those needs (see [Clause 8](#)). Adapting the model requirement to meet an organization’s records requirements may involve adding additional functional requirements not included in the model requirements presented in this standard, adding more detail to the model requirements, and/or increasing the obligation level of particular functional requirements from that stated in this document (e.g. from "should" to "shall").

Business applications that are required to manage digital records should be able to meet a range of records requirements, such as:

- applying records controls;

- carrying out records processes; and
- supporting the creation and maintenance of logical relationships between records content and metadata.

The key principles that should be observed when endeavouring to support good records outcomes in software applications are presented in ISO 15489-1. [Annex B](#) maps the principles from ISO 15489-1 to the model functional requirements presented in this document.

The design and implementation of such applications should take account of the business context and identified records requirements and should be carried out with the following objectives:

- a) a conformance with the characteristics of records systems listed in ISO 15489-1 (see [7.3](#) and [7.4](#));
- b) interoperability to support interaction with other applications and a flexible approach to the use of records controls;
- c) ease of records' use and reuse;
- d) readiness for technological or business change, such as application upgrades or administrative restructuring;
- e) readiness for business continuity in the event of unexpected disruptions.

## 7.2 Addressing records requirements in business applications

### 7.2.1 General

The purpose of this subclause is to explain some key records requirements and concepts to an IT audience — especially the concepts of records metadata and archiving.

Business applications enable business processes. Records are the product and evidence of the transactions that collectively form business processes. Records may also be the means by which transactions are enacted. The inclusion of records functionality in business applications should be undertaken from the perspective of the business process. [Figure 3](#) presents a Unified Modelling Language (UML) class diagram for a generic records management metamodel information viewpoint showing the interrelationships between the conduct of business and the making and keeping of records.

This view can be described as follows.

- In an organization, an outcome is produced by a “Business work process”, comprising of the set of activities required to produce the intended outcome.
- Where an activity comprises an exchange between two or more participants, it means a transaction has occurred. The main purpose of records management is the efficient and systematic management of information that is evidence of business transactions. This implies that information generated about a “Business transaction” is created and managed as a record and according to established conventions, methods, and procedural rules.
- A “Record” is therefore an entity, which, as a business concept, is like any other type of “Data” modelled in the data architecture as any other asset created and maintained by the organization (in this case, representing evidence of a “Business transaction” according to the “Business classification schema” of the relevant activities).
- As a specialization of “Data”, a “Record” is therefore an asset of an organization, and like any other Data, a “Record” can be made of other “Data Entities” (e.g. structured or unstructured data, contracts, letters, invoices, images, voice recordings, etc.), and consequently, of other “Records”.
- A “Record” also can have in its composition specialized “Data Entities” of the kind “Record metadata”.

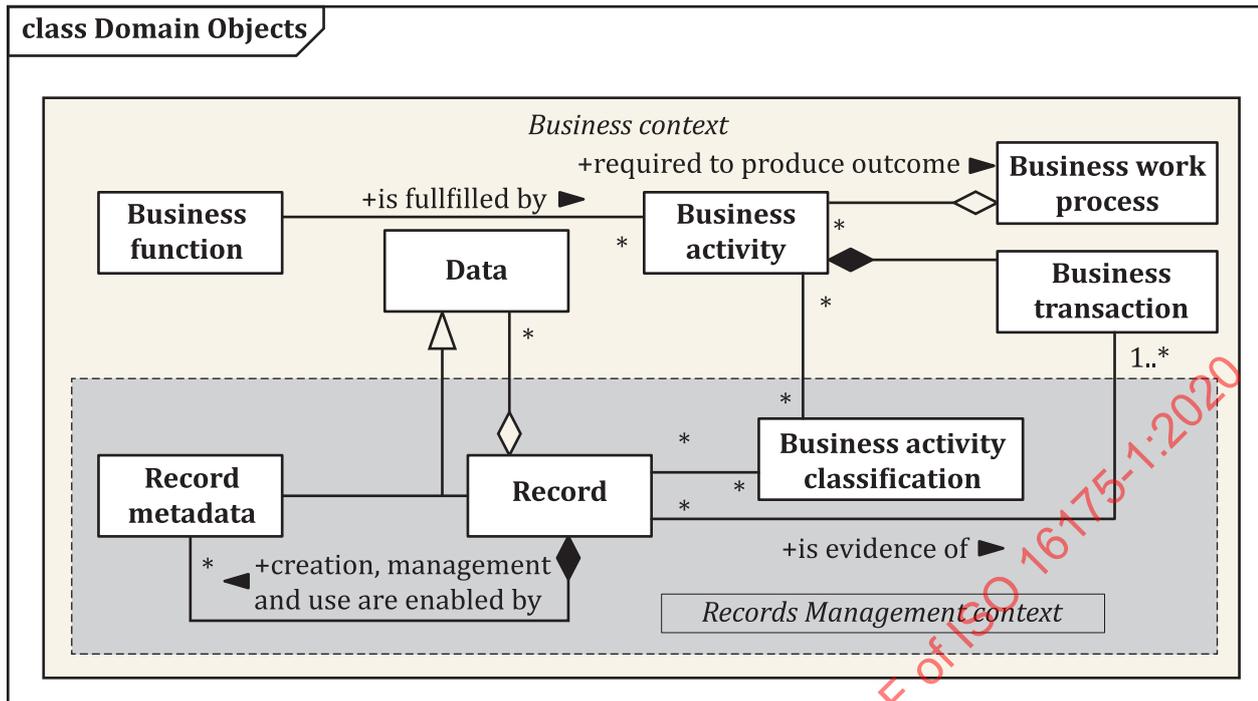


Figure 3 — How records management enables the conduct of business (UML class diagram)

### 7.2.2 Importance of records metadata

Records metadata are structured information that identifies, authenticates and contextualises records and the people, processes and systems that create, manage, maintain and use them, and the policies that govern them. While some records metadata are captured at the point of records creation, metadata continues to accrue over the life of the record. As such, it underpins all records processes. Therefore, functional requirements for records metadata are included in all the outcome areas of this document. Further guidance on metadata for records can be found at ISO 23081-1 and ISO 23081-2.

### 7.2.3 Archiving

The term “archiving” has different meanings in the records management and IT communities. In IT communities, “archiving” often means simply moving older data to offline storage.

In records management, “archiving” refers to the processes associated with identifying records of enduring value and ensuring that those records are actively managed in sustainable regimes that ensure their ongoing authenticity, integrity, reliability and usability.

“Archiving” (in the IT sense) of data to second-tier or offline storage does not change the requirements for ensuring the ongoing integrity and usability of records and should not be considered as meeting requirements relating to the retention of records that are of enduring value. In addition, the backing up of business applications for business continuity or disaster recovery purposes needs to comply with the organization’s approved records retention and disposition requirements.

## 7.3 Records characteristics that should be enabled by business applications

### 7.3.1 General

If business applications are to serve as records systems, they should capture and manage records that meet the characteristics of authoritative records as described in ISO 15489-1:2016, 5.2.2.

### 7.3.2 Authenticity

Business applications which provide authenticity to records apply business rules, processes, policies and procedures which control the creation, capture and management of records and where records creators are authorized and identified. See ISO 15489-1:2016, 5.2.2.1 for information on what makes records authentic.

### 7.3.3 Reliability

Business applications which support reliable records routinely capture records and associated metadata, and manage access and other records processes for as long as the records are required.

### 7.3.4 Integrity

Business applications which provide integrity manage records that are complete and unalterable. Policies and procedures for managing records should specify what additions or annotations may be made to a record after it is created, under what circumstances they may be authorized, and who is authorized to make them (see 6.3, requirements R3.1). Any authorized annotation, addition or deletion regarding records should be explicitly indicated and traceable.

### 7.3.5 Usability

Business applications which provide usability deliver services that locate, retrieve, and present readable records in a timely manner. The application ensures that the business context of records is maintained through the application of robust metadata management (see 6.3, requirements R4.1).

## 7.4 Characteristics of business applications that manage records

### 7.4.1 General

As explained in ISO 15489-1:2016, 5.3.2, business applications should have specific characteristics that support the management of records according to the characteristics of authoritative records.

### 7.4.2 Secure

Business applications should implement records access controls, monitoring, agent validation and authorized destruction and maintain information about the controls that were applied to a record and detailed in the record's process metadata. These applications should also have cyber-security, information security and business continuity measures assigned and/or applied.

### 7.4.3 Compliant

Business applications should be compliant with business requirements and applicable laws. This compliance should also be regularly assessed and compliance capability should be audited and reported, with logs being maintained.

### 7.4.4 Comprehensive

Business applications should be capable of managing all required records of the range of business functions and processes to which they relate utilizing the appropriate technology to do so.

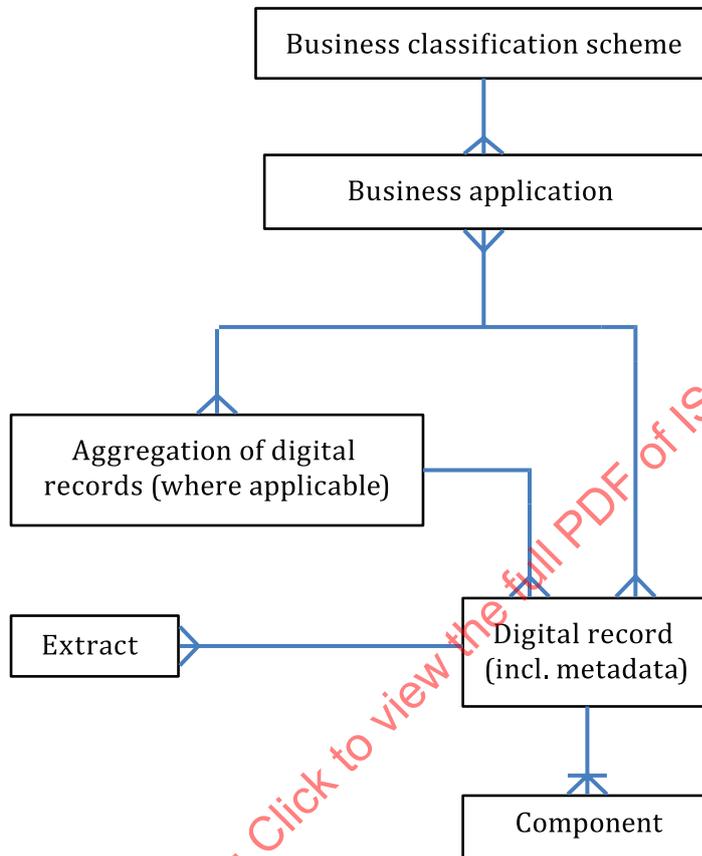
### 7.4.5 Systematic

Business applications should be designed to automate records processes as much as is required by business needs through their design and routine application of authorized policies and procedures.

## 7.5 Records entities and relationships

### 7.5.1 Entity relationship models

Figure 4 presents a conceptual relationship model for the management of digital records by a business application.



#### Key

- < one to zero or more
- \* one to one or more
- \*—\* many to many

Figure 4 — Entity model for digital records management in a business application

### 7.5.2 Business classification scheme

A business classification scheme is an ontological (relational) or taxonomical (hierarchical) classification tool that can facilitate the capture, titling, retrieval, maintenance and disposition of records. It defines the way in which records are grouped together (aggregated) and linked to the business context in which they were created or transmitted. By classifying records in this way, many of the records processes can be carried out quickly and efficiently.

Business applications will generally not co-locate records to provide this structure but that a conceptual model is created and applies as metadata from a schema. The schema may be structured by function, process or workflow considerations.

Pre-defined system rules established by the organization may provide an appropriate mechanism for enabling the automatic mapping of metadata associated with external record categories to the corresponding digital records (or aggregations of digital records) controlled by the business application.

These rules may be established to ensure that when certain types of records are created or received by the system they are automatically assigned a corresponding set of pre-determined metadata elements.

Classification schemes shall be fixed and maintained over time. Any changes to an aggregation shall be logged with an explanation. Different versions of the schemes should be tracked and linked to their dates of deployment. For more information on business classification schemes, see ISO 15489-1:2016, 8.3.

### 7.5.3 Aggregations of digital records

Aggregations of digital records are accumulations of related digital records that, when combined, may exist at a level above that of a singular digital record, for example, a folder or file. Aggregations represent relationships that exist between the digital records controlled by a business application. These relationships are reflected in the metadata links and associations that exist between the related digital records, and between the digital records and the application. This aggregation for records management purposes should not be confused with, or replaced by, the generation of multiple different aggregations in response to search requests or report queries.

A business application may comprise aggregations of records, records that are not aggregated, or both. Aggregating related digital records can improve the ability of the business application to apply records processes to those records. Business applications that support the aggregation of digital records may not require that all digital records be assigned to an aggregation on creation of the record. Aggregation may be at more than one level, depending on business needs.

Aggregations of digital records may reflect relationships such as shared characteristics or attributes, or the existence of sequential relationships between related digital records. The nature of the relationship between the digital records of a particular aggregation vary depending on factors such as the purpose and structure of the business application, and the content and format of the records themselves.

An aggregation of digital records can collectively constitute a narrative of events (that is, a series of connected business transactions), in which the records may have a sequential relationship with each other. Any such sequential relationship between digital records can be determined through the metadata associated with the records, such as titles, dates, author, and container number (where applicable). Where these relationships exist between records controlled by the business application, the application should be capable of identifying, capturing, documenting and preserving them.

These aggregations may be formal structured relationships, supported by the business application (for example, digital folders containing related digital documents), or may exist as less formalized, tightly bound metadata relationships recognized by the application as establishing links between related records within an aggregation.

### 7.5.4 Digital records

The application shall be capable of managing digital records and associated metadata. Management of the digital records controlled by the application will largely be determined by pre-defined rules established by the organization and overseen by the business application administrator. Application rules are the means by which records processes may be applied to the records and help determine how the application will operate.

### 7.5.5 Extracts

An extract is a redacted copy of a digital record, from which some material has been removed or masked. An extract is made when the full record cannot be released for access, but part of the record can. A business application may support generating and maintaining one or more extracts of a digital record.

### 7.5.6 Components

Components are constituent parts that comprise a digital record, for example, the multimedia components of a web page. Digital records will comprise at least one component. Digital records that comprise more than one component are called "compound records".

The nature of the components that comprise a given digital record will vary across applications. A component may be a digital object, such as a digital document, or a data element, such as an entry in a database. For example, a component of a digital record in an application that manages documents may consist of a single word-processed document, while components forming a digital record in a human resource management application may comprise a number of closely linked data entries in a database (such as all data entered in connection with a single staff member's personnel profile).

## 8 Using the model functional requirements

### 8.1 General

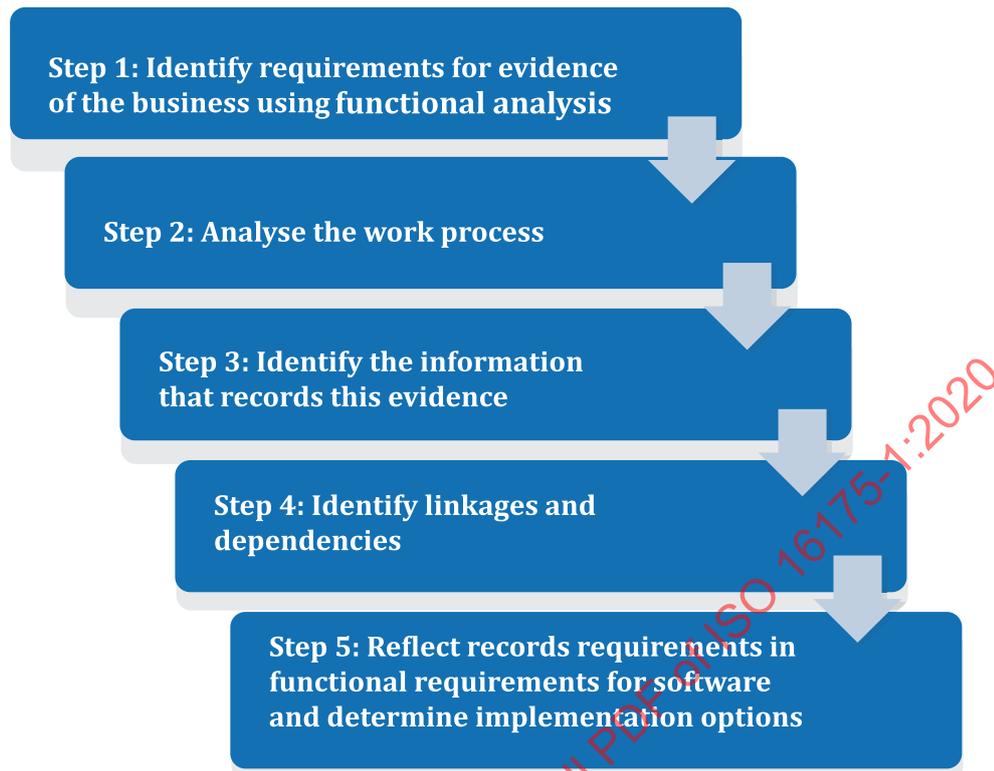
The model functional requirements presented in [Clause 6](#) provide a starting point for determining an official set of functional requirements for managing records that will be applied to the development or acquisition of a new business application or to the assessment of the adequacy of one or more existing business applications to manage records. Organizations should carry out an analysis of their business, operational and associated legal and societal needs for records, including assessments of the risks, costs and benefits associated with meeting or not meeting potential requirements, in order to refine the model requirements into a set of requirements that are fit for the purposes of the business context in question. Refining the model requirements is likely to involve both removing some non-mandatory (i.e. 'should' and 'may') requirements from the model list because they are deemed to be unnecessary and adding other requirements that are deemed important in the particular business context. See [Annex A](#) for an example of how the results of this work might be documented for use in an organization.

Before implementing the requirements in this document organization should undertake precursor business analysis as outlined in [7.2](#). Not all information contained in a business application will necessarily be required to be recorded as evidence. Before reviewing, designing, building or purchasing business applications, it is necessary to determine the organization's needs for records in order to develop and deploy appropriate strategies. Further guidance on this matter can be found at ISO 15489-1:2016, 5.3.1 and 7.3.

### 8.2 Determining needs for evidence of events, transactions and decisions in business applications (identifying the needs for records)

#### 8.2.1 General

Not all information contained in a business application are required to be recorded as evidence. Before reviewing, designing, building or purchasing business applications, it is necessary to determine the organization's needs for records in order to develop and deploy appropriate strategies and technologies. This process is outlined below in [Figure 5](#) and discussed in [8.2.2](#) to [8.2.6](#).



**Figure 5 — Steps to determine and satisfy records requirements**

For records professionals, the process of determining and documenting needs for records is called appraisal. More information on appraisal for records can be found in ISO 15489-1:2016, Clause 7 and ISO/TR 21946.

## **8.2.2 Step 1: Identifying requirements for evidence of the business using functional analysis**

**8.2.2.1** Step 1 a): Determine the broad business functions and specific activities and transactions carried out, in full or in part, by the business application

This analysis may include consideration of business process documentation and system inputs, outputs, and related policies and procedures. In highly integrated environments, multiple applications may need to be covered in the analysis in order to obtain a complete picture of the business process or activity. Particularly in the government environment, systems may also be shared by multiple organizations.

**8.2.2.1** Step 1 b): For each function, activity and transaction or business process managed by the application, consider what evidence is required to be created and retained by the organization

Requirements may be derived from a number of sources. Consider such issues as:

- legislation and regulations
- organizational rules, policies and codes of practice
- information needed to support future decision-making
- potential litigation, significant financial gains or losses and/or organizational embarrassment associated with particular functions and processes
- stakeholder and community expectations

This process may involve a wide range of consultation and validation with senior management. ISO/TR 26122 and ISO/TS 16175-2:—<sup>3)</sup> are useful in this context.

### 8.2.3 Step 2: Analysing the work process

Business applications usually store large volumes of data that are frequently updated. Because of this, it can be difficult to know what information in the application needs to be managed as a record to provide evidence of the business process or transaction.

Business applications may consist of:

- a collection of data elements (or structured data) that are linked and controlled by the application, for example, entries in a database;
- distinct digital objects controlled by the application that have a clearly defined data format (or unstructured/semi-structured data), for example, documents, emails or spreadsheets; or
- a combination of the above.

As records are directly linked to business processes, identifying records requirements is assisted by standard business process analysis techniques such as activity diagrams, process decompositions and flowcharts. It is important to work closely with the organization's records professionals during this process, as much of this work may have been undertaken when developing the organization's records management program (including its disposition authority). Further guidance on these matters can be found in ISO/TR 26122.

### 8.2.4 Step 3: Identify the information that records the required evidence

Not all information in a business application may be required to be recorded as evidence.

**8.2.4.1** Step 3 a): For each requirement for evidence, identify the content or data that make up the evidence

In applications that manage distinct digital objects, such as word-processed documents, data are already drawn together into a logical construct. Specific documents and reports that contain content that can be evidence of a particular business activity or transaction should be identified.

For other applications, it is necessary to analyse the data structures, data models and class models that underlie the application to identify the specific data elements that together constitute the content and provide the necessary evidence (see [Figures 6 and 7](#)).

It is important to note that the content or data that make up the evidence might not just be within the application. It can also be in other applications, documentation about the application, procedures and paper inputs, etc. In highly integrated environments, parts of the required evidence may be held across multiple applications.

There can be a number of different content elements that can constitute evidence. Deciding which content is best suited to form the required evidence is based on an assessment of the business need and risk. Records need to be adequate, that is, there should be sufficient evidence of the conduct of business activity or transaction to be able to account for that conduct. Therefore, a major initiative should be extensively documented, while a routine low-risk action may be documented with a minimal amount of information.

**8.2.4.2** Step 3 b): Identify the additional information required to manage the content over time as evidence

Records metadata are an integral part of the record. Metadata for records is essential to allow records to be identified, understood, managed and retrieved, and to protect the evidence of their authenticity,

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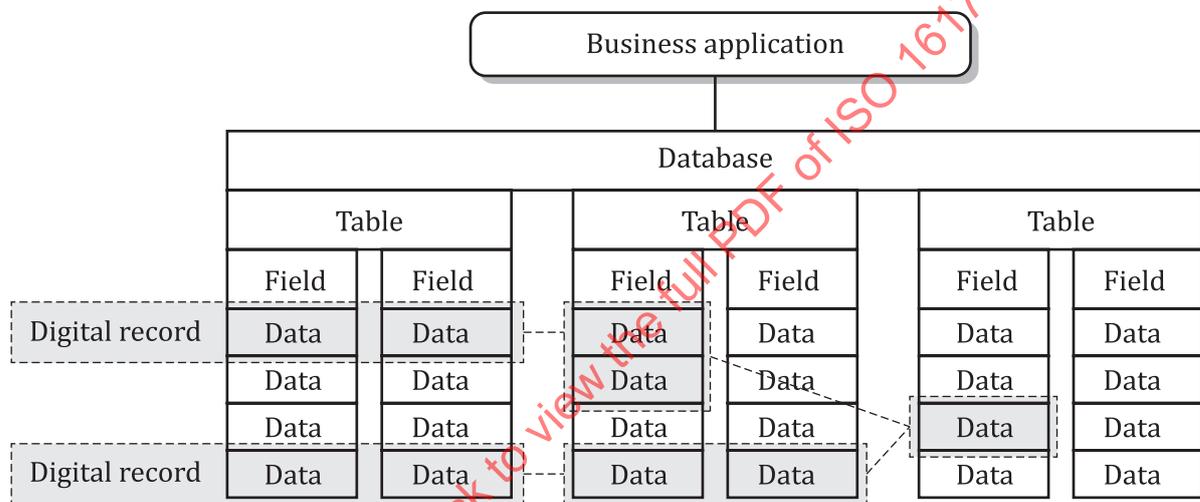
3) Under development. Stage at the time of publication: ISO/DTS 16175-2:2020.

reliability and integrity. Metadata should be captured in line with an identified metadata standard for records, as stipulated by jurisdictional and/or organizational requirements.

There is no need to retain metadata together with the content, as long as it is linked or associated in some way. Metadata may be contained in applications external to the business application in question, or may encompass documentation or tools such as XML schemas and data, and class models that allow records to be understood and remain meaningful over time.

Particularly in database environments, it can be difficult to distinguish between the record's content and its metadata. For example, metadata that provides evidence that a particular person accessed a record on a particular date and/or time is itself a record. Often metadata in a business application pertains to the application as a whole. That is, it applies in an overarching way to all records in the application, not to individual records.

Figures 6 and 7 provide examples of how data elements in database tables might be identified to comprise digital records.



**Figure 6 — Example 1: Identification of data elements comprising a digital record in a database**

NOTE A single record can include multiple elements from a single database field or table. A single data element can also form part of more than one record.

Table A: Personnel				
Staff no.	Surname	First name	Address	City
0078652	Larsen	Sevren	78/1 Hoddle St, Carlton	Melbourne
0078653	Lee	Jamie	55 Ramsey St, Vermont	Melbourne
0078654	Smith	Bob	7 Pollie Crt, Barton	Canberra
0078655	Schmidt	Helmutt	1/123 North Rd, Balmain	Sydney
0078656	Darcy	Kyra	67 Green St, My Layley	Perth

Table B: Salaries			
Pay code	Level	Year	Pay rate
A41	APS4	Year 1	\$45 000
A42	APS4	Year 2	\$46 000
A43	APS4	Year 3	\$47 000
A44	APS4	Year 4	\$48 000
A51	APS5	Year 1	\$54 000
A52	APS5	Year 2	\$55 000
A53	APS5	Year 3	\$56 000

Table C: Cost centres	
Staff no.	Pay code
0078652	A53
0078653	A42
0078654	A42
0078655	A41
0078656	A51

Table D: Staff to pay levels		
Centre code	Cost centre	Director
M001	Melbourne Office	Shay Jones
S001	Sydney Office	Fred Ngyugen
P001	Perth Office	Alberta Johnson
C001	Canberra Office	John Wasp

Table E: Staff to cost centres	
Staff no.	Cost centre
0078652	M001
0078653	M001
0078654	C001
0078655	S001
0078656	P001

**Key**

- data elements comprising the personnel record of Kyra Darcy
- data elements comprising the record of Bob Smith's address details
- data elements comprising the record of Melbourne Office Staff

**Figure 7 — Example 2: Identification of data elements comprising a digital record in a database**

With the advent of the use of increasingly complex enterprise software, there are times when it might not be possible to identify records merely by the identification of data from tables in a database. For instance, geographic information systems (GIS) are applications designed to render as maps geographically referenced data (translated into lines, points, symbols, and shapes), vector-based graphics, raster images, and textual information. Unlike databases that might just have tables with somewhat similar formats of data, GIS applications could have hundreds of layers that may include:

- regional boundaries;
- street and property locations; contour lines and other physical features; parks and recreational facilities; water mains;

- sewer lines;
- gas lines and other utilities data;
- traffic light and sign locations; fire hydrant locations;
- zoning districts;
- bicycle routes;
- neighbourhood and administrative boundaries;
- business licenses;
- property tax information (presented in tabular form when the agent clicks on individual properties); and
- numerous other types of information related to the regional infrastructure and built environment.

Depending on the configuration of the application, agents may access these layers of information in different ways including web-interfaces or any other graphical user interface that shows aggregates of data and digital options to form interactive maps.

There are some considerations in determining how to manage content within such applications as records that constitute evidence of the conduct of business. First, each of the hundreds of layers that constitute the GIS may be updated from a different source and at different durations with the common procedure being to overwrite existing data. This means it is necessary to maintain evidence of older data. For instance, while the data on hospitals or schools may be updated on a monthly or quarterly basis, data on traffic count or parking arrangements could be updated daily or even several times a day. Second, conceptual decisions need to be made about whether each of the views of the GIS should be considered and captured as a record, since it is those views (that may be a unique combination of layers with the data current at the time of generating the view) that are used to conduct transactions or make decisions.

#### 8.2.5 Step 4: Identify linkages and dependencies

A key characteristic of records is that they cannot be understood in isolation. In order to provide context for the record, information about the work process or the business application may be required to ensure the records are understandable, to prove the reliability of the evidence, or if records need to be moved from one application to another in the future. Required information may include:

- location;
- application issues/faults;
- size;
- business rules implemented;
- file formats;
- security;
- privacy management;
- data structures;
- data and class models;
- workflow routing rules.

Required information about the work process may include relevant policies and procedural documents to show that decisions are made, and processes undertaken in accordance with authorized standards.

In addition, many processes extends beyond a single business application. Necessary linkages to other applications, or related information in paper form, should also be considered before strategies are developed to manage the records in the business application.

A key dependency is how long the records need to be kept. Records shall be retained for a period of time that is in accordance with authorized legislative, jurisdictional and societal requirements and business needs. Decisions about how long records shall be retained are defined in a disposition authority. Organizations will need to meet the requirements of relevant jurisdictional authorities for retaining and disposing of records.

Records that are required to be retained for longer periods will generally require more controls to ensure they can be managed and remain accessible for as long as required, as specified in an authorized disposition authority. Depending on demand for access to older records, the organization may decide not to keep all records in the live application. Nevertheless, it is essential that they can be identified and retrieved in accordance with agreed service levels.

### **8.2.6 Step 5: Reflect requirements for evidence of business in functional requirements for software and determine implementation options**

Having completed the four steps described above, the organization is now ready to supplement the model functional requirements presented in [Clause 6](#) with additional functional requirements that are necessary to ensure that the particular evidence its business requires can be captured and managed by the software applications used to carry out that business. Detailed guidance on completing this step can be found in [8.3](#) to [8.6](#).

## **8.3 Functional requirements conformity assessment**

### **8.3.1 General**

Organizations may use the functional requirements to review and assess the functionality for records in existing business applications. Such a review will give an organization:

- an understanding of existing business applications' capacity to address records functionality; and
- an informed basis for developing strategies to improve the records functionality.

### **8.3.2 Undertaking the conformity assessment process**

The conformity assessment process is essentially a “gap analysis”, comparing a particular business application with the functional requirements as an established benchmark.

When undertaking the assessment, 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 application itself.

Where records are being managed in a separate software application, assessing conformity should consider the conformity level of both applications.

The focus of the conformity assessment process will vary depending on the nature of the review. A review initiated as part of an audit process will focus on identifying the level of conformity in the areas where the business application fails to support adequately the records requirements of the organization. In contrast, a review conducted as a preliminary step towards upgrading an existing business application will focus on identifying strengths and weaknesses in the existing software and areas of additional functionality that may be incorporated to meet the organization's business needs.

Conducting an assessment of a business application may comprise the following tasks:

a) Preparation and preliminary research

Identify the business software application, or applications, that will be the subject of the assessment, along with their components (including integrated databases), supporting infrastructure and documentation. Undertake preliminary research so that staff conducting the assessment can familiarise themselves with the business processes managed or controlled by the business application, the software itself and the objectives of the review.

b) Create a checklist of functional requirements

Compile all requirements that are relevant to the organization's business and records needs into a checklist, including relevant obligation levels.

The checklist may consist of a straightforward list of requirements, or may be reframed as a series of questions. Depending on the purpose of the assessment, 'yes' and 'no' responses to determine a pass or fail for each requirement may be appropriate, or a rating system to measure the degree of conformity (for example, a scale of 1 to 5 for each requirement) could be used. The method employed should allow a clear determination to be made on whether each requirement has been adequately addressed by the business application.

The checklist should include space for comments so that details of how each requirement is met can be included. It is particularly useful to capture information of 'workarounds' that have been adopted by staff to deal with any perceived shortcomings of the application itself.

c) Apply the checklist to the business application

In order to be able to apply the checklist, it is necessary to have a good understanding of how the application presently manages the records of the identified business processes. An assessment based on ISO/IEC 33002 and ISO/IEC TS 33030 can be helpful in this regard.

Applying the checklist may involve a mix of "hands-on" demonstration of the application as well as discussions with relevant business managers, business application administrators and application users to understand the interplay of software functionality with related processes and procedures, to capture a full picture of how each aspect of managing records is, or is not, met.

Where the business application is assessed as not meeting a functional requirement, it will be necessary to determine whether this is because of a fundamental inadequacy of the application or because the application has simply not been configured to perform the identified functionality.

d) Evaluate the results of the review and prioritize improvements

Evaluate the information collected during the review, identify weaknesses and strengths, and determine recommendations for improving functionality for records. Recommendations may be prioritized based on risk, importance and feasibility. For example, if the application is unlikely to be developed in the near future, greater attention could be paid to improving records processes through implementing revised business rules, whereas if the review was undertaken to inform application redevelopment, then priority could be given to mechanisms to improve the management of records.

## 8.4 Risk assessment

Risk assessment is a key factor to incorporate into the development of appropriate strategies. Risks may arise from not creating records in the first place, from disposing of records too soon, or from not ensuring the accessibility and readability of records over time. Possible consequences arising from these risks may include adverse publicity, inefficient business functions and processes and a reduction in the organization's capacity to prosecute or defend allegations.

A robust risk assessment will inform the level of evidence required and how stringent records requirements should be. Organizations may have jurisdiction-specific risk management frameworks in

place that define different levels of risk, which can be used to prioritize the identified requirements for evidence. Assessing risk may also identify opportunities for organizations (such as improved decision making) to enhance their systems and processes using software functionality.

It is particularly necessary to undertake a risk assessment where part of the evidence or record is supplied by an external organization, or where information is held in systems shared by multiple organizations. Consideration needs to be given as to whether that external organization or shared system can be relied on to maintain the necessary evidence for the required period. Strategies to mitigate this risk may involve ensuring the necessary evidence is kept within applications under the control of the organization, or that agreements for shared systems include these requirements.

A feasibility analysis can help organizations to consider, in a structured way, the financial, technical, legal or operational capacity of the organization to meet the requirements. A feasibility analysis will help the making of informed and transparent decisions at key points during the developmental process.

Assessing operational feasibility may require consideration of issues such as the nature and level of user involvement in the development and implementation of the application, and management support for the new application. A technical feasibility assessment may consider the knowledge of current and emerging technological solutions and the availability of technically qualified staff for the duration of the project and subsequent maintenance phase.

This phase helps the prioritization of applications that should be assessed for records functionality. This top-level risk assessment should be conducted for each business application to help determine which applications should progress to the next phase and which do not need to advance further.

Assessment of existing applications should enable an appreciation of their potential exposure to records-related business and accountability risks. This in turn should inform the prioritization of functional records requirements in any project involving application redevelopment or replacement.

Further information on risk assessment can be found in ISO/TR 18128.

## **8.5 Determining functional requirements for managing records in an application design specification**

### **8.5.1 General**

The model functional requirements in this document can be used to inform the development of a set of functional records requirements in a design specification for a software application. As part of the procurement or design process, the business application software will be evaluated against the requirements stipulated in the design specification, including functional records requirements. As the model functional requirements are generic in nature, it is necessary for an organization to review these requirements in light of its own particular business needs and constraints, and records requirements. This analysis will help to identify the functionality the business application will be required to deliver. It is important for project teams to draw on a range of expertise, including business owners, risk experts and records professionals, to ensure that applications are not over-specified, but are appropriate for their risk profile.

### **8.5.2 Step 1 — Assess the functional requirements**

Establish the extent to which the records will be managed within the business application. For example, if the business application will only be responsible for creating the records, with the records subsequently exported to an electronic records management application for ongoing management, the functional requirements should be assessed to identify the appropriate and relevant requirements for inclusion in the specification, along with any additional requirements relating to application integration/export.

### 8.5.3 Step 2 — Check appropriateness of the requirements

It should be considered whether the description of the functional requirements identified as applicable in Step 1 is appropriate for the organization. The descriptions of some requirements may need to be adjusted to better reflect the organization's business needs.

In order to determine whether the functionality described is appropriate to the organization's business and records requirements, the appropriateness of mandatory and optional requirements should be assessed. Questions to consider include:

- Is the requirement appropriate for the organization's business and records needs?
- Will the functionality described in the document be used?
- Is it more cost effective or efficient to fulfil the requirement outside the business application?

Consider implementing extra functionality that will add value to the business application and assist in performing the organization's business functions and processes. Remove any functionality that is surplus to the organization's needs.

### 8.5.4 Step 3 — Check appropriateness of the obligation levels

Evaluate the obligation levels attached to the requirements to determine whether they should be mandatory or desirable, in line with records requirements. The obligation levels attached to the functional requirements provide a guide for use in developing an organization's own software design specification. Depending on decisions as to what extent records functionality will be achieved by building it into the application, or by integrating with an electronic records management application, some requirements (including those recommended as mandatory) may not be relevant.

Organizations should consider carefully before removing a mandatory requirement or altering a mandatory obligation level. This may involve identifying how the functionality described in the requirement can be achieved through a substitute practice. For example, some requirements may outline functionality that could be addressed through the implementation of appropriate business rules rather than a software solution.

### 8.5.5 Step 4 — Identify gaps in the functional requirements

Assess the functional requirements identified as appropriate in their totality to determine whether the organization requires any functionality that is not adequately covered by the requirements. Add any additional requirements necessary to meet the gap in required functionality.

## 8.6 Assessing options for deploying functionality in one or more software applications

Following the identification of requirements for evidence in the form of records, and of the related dependencies and linkages, appropriate strategies to manage the records can be devised. Strategies should be based on an assessment of records-related risks.

To be considered an authentic and reliable evidence, content shall be fixed to a point in time and unalterable. Because business applications may contain dynamic, current data that is subject to regular updates, strategies for maintaining fixed/immutable data elements comprising records shall be implemented. These strategies will be influenced by the decision regarding which application will manage the records and informed by an options assessment.

For business applications that manage distinct digital objects, fixing a record to make it immutable can be done through application controls, such as setting the object as "read only", and applying metadata that documents the record's management and use over time, for example, event history metadata.

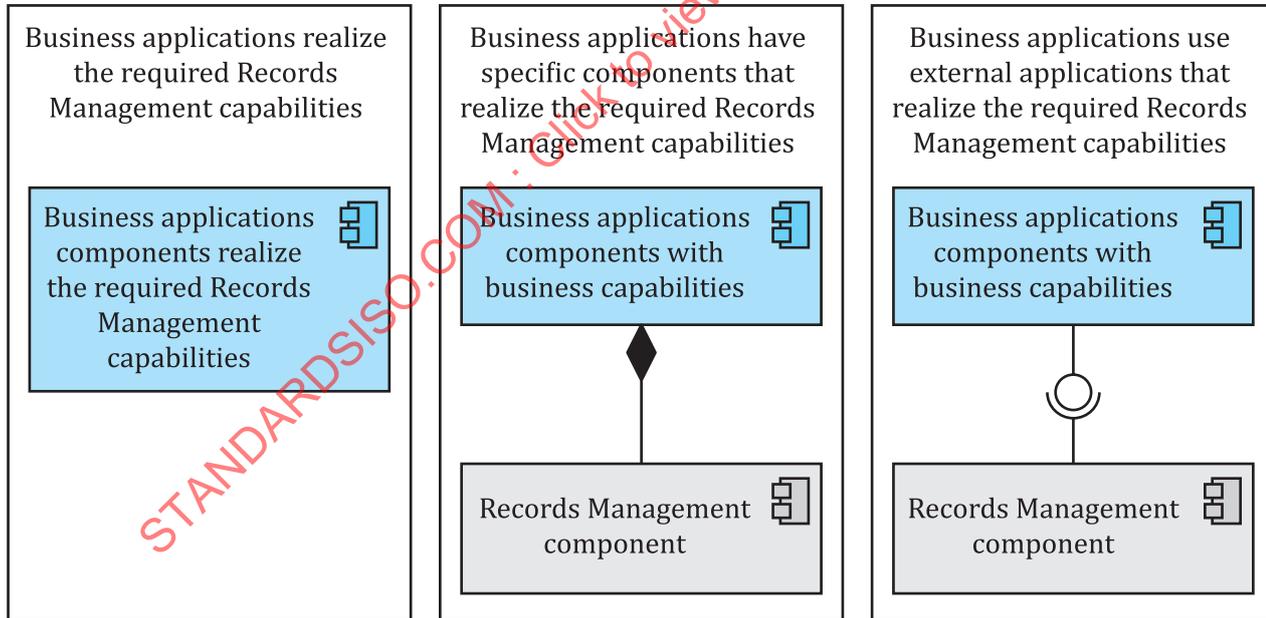
In contrast, database applications contain data that is frequently updated, manipulable and non-redundant or current, and therefore can pose challenges for ensuring the immutability of a record. Strategies to address this could include:

- Designing controls that prevent the overwriting or deletion of specific data into the application. For example, this could involve permitting the updating of data but recording the previous values in a history status field. The record is formed by the combination of specified fields and the associated event history data. This does not mean all changes to data in the application are required to be retained. It is only applicable to those data elements that have been identified as forming the content of the evidential requirements.
- Bringing together the selected data elements (this may be from within the same table or selected data from rows in different tables) and creating a distinct digital object that is fixed and unalterable. This strategy could involve generating a report or a read-only 'historical' version of the database.

The decision as to which approach to take for a particular business application will be affected by a number of factors:

- the organization’s business needs, including the risk level for the particular business function. High-risk functions require more detailed documentation and records management controls;
- the overarching records management framework, including whether a distributed or centralised approach to records management is preferred; and
- consideration of what is technically feasible, given the particular applications concerned.

The realization of records management requirements in business applications can be achieved through different reference scenarios, as illustrated in [Figure 2](#) and in [Figures 8](#) and [9](#) below [Universal Modelling Language (UML) and ArchiMate<sup>4</sup>] diagrams showing equivalent scenarios to [Figure 2](#).



NOTE 1 The original figure can be found in ISO/TR 21965.

NOTE 2 For information on the Unified Modelling Language see <https://www.uml.org/>.

**Figure 8 — Records management reference application scenarios (UML Components diagram)**

4) ArchiMate is a modelling language for enterprise architectures. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named.