



InterPARES 3 Project

International Research on Permanent Authentic Records in Electronic Systems

TEAM Canada

Title: General Study 04 – International Standards Relevant to the InterPARES 3 Project

Status: Final (public)

Version: 1.8

Date Created: January 2008

Last Revised: April 2013

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Project Component: Research

URL: http://www.interpares.org/ip3/display_file.cfm?doc=ip3_canada_gs04_international_standards.pdf

Document Control

Version history			
<u>Version</u>	<u>Date</u>	<u>By</u>	<u>Version notes</u>
1.0	2008-01-20	S. Xie	Initial version submitted for review.
1.1	2008-01-21	S. Xie	Incorporated MoReq2.
1.2	2008-01-25	S. Xie	Added more standard related to records management and information security.
1.3	2008-04-24	R. Preston	Minor content and copy editing.
1.4	2009-01-23	R. Preston	Minor copy editing.
1.5	2010-08-22	J. Hammerschmidt	Updated content.
1.6	2010-10-26	R. Preston	Minor content editing.
1.7	2010-10-27	R. Preston	Removal of links to copyrighted materials.
1.8	2013-04-29	R. Preston	Incorporation of updates and revisions.

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1. Preamble

The task of identifying and entering into the InterPARES 3 Bibliographic Database annotated citations for all international standards relevant to the research activities of the Project (e.g., ISO standards, ICA standards, etc.) was assigned to TEAM Canada during the October 2007 International Summit in Rome, Italy. These include standards that are relevant to the goals, objectives, research activities and expected outcomes of the Project as a whole.

Because the Project's goals, objectives, research activities and expected outcomes cover a wide range of areas in the areas of digital records creation, management and preservation, an effort was made during the search to identify key aspects of each standard in relation to the above defined task scope. Examples of the key aspects that were used to assist searching and retrieval of relevant standards include: *digital preservation; records reliability, accuracy and authenticity; access to information; creation and maintenance of all kinds of records; cost for records management and digital preservation; construction and dissemination educational materials in digital format; legal issues related to records management and digital preservation; risk management; information security; resource discovery; and interoperability.*

As a result of the broad coverage of the Project, the list of international standards presented in this report cannot be considered exhaustive. Some standards included in the present list (e.g., those on quality management and project management) were collected based on the author's understanding of the Project case studies on which she currently is working (i.e., Canadian Tourism Commission and the City of Vancouver). In other words, it is likely that the need for reference to additional international standards not included in the current list will emerge for individual case studies during the course of the research.

It should also be noted that the search for relevant international standards was not limited to de facto standards, it also included de jure standards. Within this context, the term "international" was interpreted to include standards that are issued by, and/or that might apply to, any organizations that have a multinational, sectoral or discipline-wide composition. The identified standards in this report are grouped by the type of organization that produces or issues them.

Given the dynamic nature of the international standards environment, readers should consider this a constantly evolving document, to which periodic revisions will be made to incorporate newly discovered or updated information.

2. International Standards relevant to InterPARES 3

Note: Where available, a URL for the description of each standard is provided following the description. An additional URL is provided under the title of the standard when the full text of the standard is available.

2.1 ICA Standards

Note: Listed in alphabetical order.

ISAAR(CPF): International Standard Archival Authority Record for Corporate Bodies, Persons, and Families, Second edition, 2004

(full text at <http://www.ica.org/sites/default/files/ISAAR2EN.pdf>)

This standard provides guidance for preparing archival authority records that provide descriptions of entities (corporate bodies, persons and families) associated with the creation and maintenance of archives.

The companion standard to this document, *ISAD(G): General International Standard Archival Description*, provides for the inclusion of contextual information within the description of archives at any level. ISAD(G) also recognises the possibility of capturing and maintaining contextual information independently and linking that contextual information to the combination of other information elements used to describe archives and records.

This standard is intended to support the sharing of archival authority records by promoting the preparation of consistent, appropriate and self-explanatory descriptions of corporate bodies, persons and families that create records. It is intended to be used in conjunction with existing national standards or as the basis for the development of national standards.

ISO standards relevant to ISAAR(CPF):

- *ISO 639-2—Codes for the representation of names of languages, Alpha-3 code, 1998.*
- *ISO 690—Documentation—Bibliographic references—Content, form and structure, 1987.*
- *ISO 690-2—Documentation—Bibliographic references—Electronic documents or parts thereof, 1992.*
- *ISO 999—Information and documentation—Guidelines for the content, organization and presentation of indexes, 1996.*
- *ISO 2788—Documentation—Guidelines for the establishment and development of monolingual thesauri, 1986.*
- *ISO 3166—Codes for the representation of names of countries, 1997.*
- *ISO 5963—Documentation—Methods for examining documents, determining their subjects, and selecting indexing terms, 1985.*

- *ISO 5964—Documentation—Guidelines for the establishment and development of multilingual thesauri, 1985.*
- *ISO 8601—Data elements and interchange formats—Information interchange—Representation of dates and times, 2nd ed., 2000.*
- *ISO 15489—Information and documentation—Records management, parts 1 and 2, 2001.*
- *ISO 15511—Information and documentation—International standard identifier for libraries and related organizations, 2003.*
- *ISO 15924—Codes for the representation of names of scripts, 2003.*

ISAD (G): General International Standard Archival Description, Second edition, 2000

(full text at http://www.ica.org/sites/default/files/isad_g_2e.pdf)

This standard provides general guidance for the preparation of archival descriptions. It is to be used in conjunction with existing national standards or as the basis for the development of national standards.

The following ISO standards are recommended by ISAD(G) as useful for developing and maintaining controlled vocabularies:

- *ISO 5963 Documentation—Methods for examining documents, determining their subject, and selecting indexing terms*
- *ISO 2788 Documentation—Guidelines for the establishment and development of monolingual Thesauri*
- *ISO 999 Information and documentation—Guidelines for the content, organization and presentation of indexes.*

The latest version of *ISO 690 Documentation—Bibliographic references—Content, form and structure* is recommended by ISAD(G) for citing a published source in any of its elements of description.

ISAF: International Standard on Activities/Functions of Corporate Bodies (draft), 2006

(full text at http://www.ica.org/sites/default/files/ISAF_ENG.pdf)

This standard provides guidance for preparing descriptions of functions/activities of corporate bodies associated with the creation and maintenance of archives.

Descriptions of functions/activities are intended to complement and supplement descriptions of records created in accordance with ISAD(G) and authority records created in accordance with ISAAR(CPF). Descriptions of the functions/activities performed by corporate bodies can explain how, why and by whom a function or an activity was performed from the time the corporate body first began performing it until the date the corporate body ceased

performing it. They can explain how and why records were produced and used and show their relationships with the function or activity and with other records. They can also provide access to all the records created or used in connection with a single activity. Keeping this information separate both from the descriptions of the records and the authority records means less repetition of information and allows for the construction of flexible archival descriptive systems.

ISO standards relevant to ISAF:

- *ISO 639-2—Codes for the representation of names of languages, Alpha-3 code, 1998.*
- *ISO 999—Information and documentation—Guidelines for the content, organization and presentation of indexes, 1996.*
- *ISO 2788—Documentation—Guidelines for the establishment and development of monolingual thesauri, 1986.*
- *ISO 3166—Codes for the representation of names of countries, 1997.*
- *ISO 5963—Documentation—Methods for examining documents, determining their subjects, and selecting indexing terms, 1985.*
- *ISO 5964—Documentation—Guidelines for the establishment and development of multilingual thesauri, 1985.*
- *ISO 8601—Data elements and interchange formats—Information interchange—Representation of dates and times, 2nd ed., 2000.*
- *ISO 15489—Information and documentation—Records management, parts 1 and 2, 2001.*
- *ISO 15511—Information and documentation—International standard identifier for libraries and related organizations, 2003.*
- *ISO 15924—Codes for the representation of names of scripts, 2001.*

Record Exchange Standard (draft), 2007

(full text at <http://www.ica.org/sites/default/files/Records%20Exchange%20Standard.pdf>)

This standard defines a general producer-archive transfer process and transfer format for digital records, in compliance with OAIS and PAIMAS models. Its purpose is to reduce the risk of loss or compromised records, and the overall cost of transferring digital records from one system to another. This standard is endorsed by ICA, UN/CEFACT and CEN, in liaison with ISO.

ISO standards relevant to the Record Exchange Standard:

- *ISO 14721:2003—Space data and information transfer systems—Open archival information system—Reference model. (OAIS model)*
- *ISO 20652: 2006 Space data and information transfer systems—Producer-archive interface—Methodology abstract standard. (PAIMAS model)*

2.2 ISO Standards

Note: Listed in order of ascending ISO standard number.

ISO 639-1: 2002 Codes for the representation of names of languages—Part 1: Alpha-2 code

This part of ISO 639 provides a code consisting of language code elements comprising two-letter language identifiers for the representation of names of languages. The language identifiers according to this part of ISO 639 were devised originally for use in terminology, lexicography and linguistics, but may be adopted for any application requiring the expression of language in two-letter coded form, especially in computerized systems. The alpha-2 code was devised for practical use for most of the major languages of the world that are not only most frequently represented in the total body of the world's literature, but which also comprise a considerable volume of specialized languages and terminologies. Additional language identifiers are created when it becomes apparent that a significant body of documentation written in specialized languages and terminologies exists. Languages designed exclusively for machine use, such as computer-programming languages, are not included in this code.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=22109

ISO 639-2: 1998 Codes for the representation of names of languages, Alpha-3 code

ISO 639 provides two sets of language codes, one as a two-letter code set (639-1) and another as a three-letter code set (this part of ISO 639) for the representation of names of languages. ISO 639-1 was devised primarily for use in terminology, lexicography and linguistics. This part of ISO 639 represents all languages contained in ISO 639-1 and in addition any other language as well as language groups as they may be coded for special purposes when more specificity in coding is needed. The languages listed in ISO 639-1 are a subset of the languages listed in ISO 639-2; every language code in the two-letter code set has a corresponding language code in the alpha-3 list, but not necessarily vice versa.

Both code lists are to be considered as open lists. The codes were devised for use in terminology, lexicography, information and documentation (i.e., for libraries, information services, and publishers) and linguistics. This part of ISO 639 also includes guidelines for the creation of language codes and their use in some applications.

Source: Library of Congress <http://www.loc.gov/standards/iso639-2/langhome.html>

ISO 639-3: 2007 Codes for the representation of names of languages—Part 3: Alpha-3 code for comprehensive coverage of languages

This standard provides a code, published by the Registration Authority of ISO 639-3, consisting of language code elements comprising three-letter language identifiers for the representation of languages. The language identifiers according to this ISO 639-3:2007 were devised for use in a wide range of applications, especially in computer systems, where there

is potential need to support a large number of the languages that are known to have ever existed. Whereas ISO 639-1 and ISO 639-2 are intended to focus on the major languages of the world that are most frequently represented in the total body of the world's literature, ISO 639-3:2007 attempts to provide as complete an enumeration of languages as possible, including living, extinct, ancient and constructed languages, whether major or minor, written or unwritten. As a result, ISO 639-3:2007 deals with a very large number of lesser-known languages. Languages designed exclusively for machine use, such as computer-programming languages and reconstructed languages, are not included in this code.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=39534

ISO 690: 1987 Documentation—Bibliographic references—Content, form and structure

This standard specifies the elements to be included in bibliographic references to published monographs and serials, to chapters, articles, etc. in such publications and to patent documents. Sets out a prescribed order for the elements of the reference and establishes conventions for the transcription and presentation of information derived from the source publication.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=4888

ISO 690-2: 1992—Documentation—Bibliographic references—Electronic documents or parts thereof

This part of ISO 690 specifies the elements to be included in bibliographic references to electronic documents. It sets out a prescribed order for the elements of the reference and establishes conventions for the transcription and presentation of information derived from the source electronic document.

This standard is intended for use by authors and editors in the compilation of references to electronic documents for inclusion in a bibliography, and in the formulation of citations within the text corresponding to the entries in that bibliography. It does not apply to full bibliographic descriptions as required by librarians, descriptive and analytic bibliographers, indexers, etc.

Source: <http://www.collectionscanada.gc.ca/iso/tc46sc9/standard/690-2e.htm>

ISO 999: 1996 Information and documentation—Guidelines for the content, organization and presentation of indexes

This standard provides guidelines for the content, arrangement and presentation of indexes to books, periodicals, reports, patent documents and other written documents, as well as for non-print materials, such as electronic documents, films, sound and video recordings.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=5446

ISO 2788: 1986 Documentation—Guidelines for the establishment and development of monolingual thesauri

The recommendations in this standard are intended to ensure consistent practice within a single indexing agency, or between different agencies (for example members of a network). These recommendations relate to monolingual thesauri, without reference to the special requirements of multilingual thesauri.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=7776

ISO 3166-1: 2006 Codes for the representation of names of countries and their subdivisions—country codes, 2006

This standard is intended for use in any application requiring the expression of current country names in coded form; it also includes basic guidelines for its implementation and maintenance.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=39719

See also: <http://geotags.com/iso3166/countries.html>

ISO 5963: 1985 Documentation—Methods for examining documents, determining their subjects, and selecting indexing terms.

This standard describes general techniques for document analysis that should apply in all indexing situations. These techniques can be employed by any agency in which human indexers analyse the subjects of documents and express these subjects in indexing terms. It is intended to promote standard practice within an agency or network of agencies as well as between different indexing agencies, especially those that exchange bibliographic records.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=12158

ISO 3901:2001 Information and documentation—International Standard Recording Code (ISRC)

This standard was prepared by ISO Technical Committee (TC) 46, Subcommittee (SC) 9, which is responsible for ISO International Standards for the identification and description of information resources.

The International Standard Recording Code (ISRC) provides a means of identifying audio recordings and music video recordings internationally. An ISRC identifies the recording throughout its life and is intended for use by producers of recordings as well as by copyright organisations, broadcasting organisations, media libraries and archives, etc.

The purpose of this standard is to define and promote the use of a standard code for the unique identification of recordings. The International Standard Recording Code (ISRC) may be applied to audio recordings and music video recordings regardless of whether they are in analogue or digital formats. The ISRC shall not be used for the numbering of audio or audiovisual carriers (e.g., compact discs or videocassettes).

Audiovisual recordings, other than music video recordings produced in conjunction with an audio recording, are excluded from the scope of this International Standard. Such audiovisual recordings should be assigned an International Standard Audiovisual Number (ISAN) in accordance with ISO 15706.

Source: <http://www.collectionscanada.gc.ca/iso/tc46sc9/standard/3901e.htm>

See also: http://www.id3.org/ISO_3901

ISO 5964: 1985 Documentation—Guidelines for the establishment and development of multilingual thesauri

This standard should be used in conjunction with ISO 2788, and is regarded as an extension of the scope of the monolingual guidelines. The majority of procedures and recommendations contained in ISO 2788 are equally valid for a multilingual thesaurus. This applies particularly to general procedures, for example, the forms of terms, the basic thesaural relationships, and management operations such as evaluation and maintenance. Distinction is made between preferred terms and non-preferred terms.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=12159

See also: <https://xmdr.org/standards/cmmaps/ISO5964.doc>

ISO 8601:2004 Data elements and interchange formats—Information interchange—Representation of dates and times

This standard is applicable whenever representation of dates in the Gregorian calendar, times in the 24-hour timekeeping system, time intervals and recurring time intervals or of the formats of these representations are included in information interchange. It includes:

- calendar dates expressed in terms of calendar year, calendar month and calendar day of the month;
- ordinal dates expressed in terms of calendar year and calendar day of the year;
- week dates expressed in terms of calendar year, calendar week number and calendar day of the week;
- local time based upon the 24-hour timekeeping system;
- Coordinated Universal Time of day;
- local time and the difference from Coordinated Universal Time;
- combination of date and time of day;
- time intervals; and

- recurring time intervals.

It does not cover dates and times where words are used in the representation and dates and times where characters are not used in the representation.

It also does not assign any particular meaning or interpretation to any data element that uses representations in accordance with ISO 8601:2004. Such meaning will be determined by the context of the application.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=40874

See also: <http://xml.coverpages.org/ISO-FDIS-8601.pdf>

ISO 8879:1986 Information processing—Text and office systems—Standard Generalized Markup Language (SGML)

SGML is a set of rules for defining and expressing the logical structure of documents thereby enabling software products to control the searching, retrieval, and structured display of those documents. The rules are applied in the form of markup (tags) that can be embedded in an electronic document to identify and establish relationships among structural parts. Because consistent markup of similarly structured documents is key to successful electronic processing of them, SGML encourages consistency by introducing the concept of a document type definition (or DTD). A DTD prescribes the ordered set of SGML markup tags available for encoding the parts of documents in a similar class. Archival finding aids, which share similar parts and structure, form a class of documents for which a DTD could be and was developed.

Source: EAD Web site <http://www.loc.gov/ead/eaddev.html>

ISO 9000:2005 Quality management systems—Fundamentals and vocabulary

This standard describes fundamentals of quality management systems, which form the subject of the ISO 9000 family, and defines related terms.

It is applicable to the following:

- organizations seeking advantage through the implementation of a quality management system;
- organizations seeking confidence from their suppliers that their product requirements will be satisfied;
- users of the products;
- those concerned with a mutual understanding of the terminology used in quality management (e.g., suppliers, customers, regulators);
- those internal or external to the organization who assess the quality management system or audit it for conformity with the requirements of ISO 9001 (e.g., auditors, regulators, certification/registration bodies);

- those internal or external to the organization who give advice or training on the quality management system appropriate to that organization; and
- developers of related standards.

Source: ISO Web site http://www.iso.org/iso/catalogue_detail?csnumber=42180

ISO 9001:2000 Quality management systems—Requirements

This standard specifies requirements for a quality management system where an organization

1. needs to demonstrate its ability to consistently provide product that meets customer and applicable regulatory requirements, and
2. aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable regulatory requirements.

All requirements of this standard are generic and are intended to be applicable to all organizations, regardless of type, size and product provided.

Where any requirement(s) of this standard cannot be applied due to the nature of an organization and its product, this can be considered for exclusion.

Where exclusions are made, claims of conformity to this standard are not acceptable unless these exclusions are limited to requirements within clause 7, and such exclusions do not affect the organization's ability, or responsibility, to provide product that meets customer and applicable regulatory requirements.

Source: ISO Web site http://www.iso.org/iso/catalogue_detail?csnumber=21823

See also: <http://www.isoqar.com/iso9001/qualintro.htm>

ISO IWA 4:2005 Quality management systems—Guidelines for the application of ISO 9001:2000 in local government

This standard provides local governments with guidelines for the voluntary application of ISO 9001:2000 on an integral basis. These guidelines do not, however, add, change or modify the requirements of ISO 9001:2000.

For a local government to be considered reliable, it should guarantee minimum conditions of reliability for the processes that are necessary to provide all the services needed by its citizens in a consistent and reliable manner. All the local government's processes, including management, core, operational and support processes, should constitute a single, integral, quality management system. The integral character of this system is important because, otherwise, although a local government could be reliable in some areas of activity, it may be unreliable in others. For a government to be considered reliable, it should guarantee minimum conditions of reliability for all key processes and services. To achieve this, it is

advisable that the local government clearly identify the management, core and support processes that, together, make it reliable (see Annex A). Annex B provides a diagnostic tool for local governments to evaluate the scope and maturity of their processes and services.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=43020

ISO 9004:2000 Quality management systems—Guidelines for performance improvements

This standard provides guidelines beyond the requirements given in ISO 9001 to consider both the effectiveness and efficiency of a quality management system and, consequently, the potential for improvement of the performance of an organization. When compared to ISO 9001, the objectives of customer satisfaction and product quality are extended to include the satisfaction of interested parties and the performance of the organization.

This standard is applicable to the processes of the organization and consequently the quality management principles on which it is based can be deployed throughout the organization. The focus of this International Standard is the achievement of ongoing improvement, measured through the satisfaction of customers and other interested parties.

It consists of guidance and recommendations and is not intended for certification, regulatory or contractual use, not as a guide to the implementation of ISO 9001.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=28692

ISO/IEC 9834-8:2008 Information technology—Open Systems Interconnection—Procedures for the operation of OSI Registration Authorities: Generation and registration of Universally Unique Identifiers (UUIDs) and their use as ASN.1 Object Identifier components

This standard specifies the format and generation rules that enable users to produce 128-bit identifiers that are either guaranteed or have a high probability of being globally unique.

The UUIDs generated in conformance with ISO/IEC 9834-8:2008 are suitable either for transient use, with generation of a new UUID every 100 nanoseconds, or as persistent identifiers.

This standard is derived from earlier non-standard specifications of UUIDs and their generation, and is technically identical to those earlier specifications. It specifies the procedures for the operation of a Web-based Registration Authority for UUIDs.

It also specifies and allows the use of UUIDs (registered or not registered) as OID components under the arc {joint-iso-itu-t uuid(25)}. This enables users to generate OIDs without any registration procedures. It also specifies and allows the use of UUIDs (registered or not registered) to form a URN.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_detail_ics.htm?csnumber=53416

ISO 10005:2005: Quality management systems—Guidelines for quality plans

This standard provides guidelines for the development, review, acceptance, application and revision of quality plans. It is applicable whether or not the organization has a management system in conformity with ISO 9001.

This standard is applicable to quality plans for a process, product, project or contract, any product category (hardware, software, processed materials and services) and any industry. It is focused primarily on product realization and is not a guide to organizational quality management system planning.

It is a guidance document and is not intended to be used for certification or registration purposes.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=37006

ISO 10006:2003 Quality management systems—Guidelines for quality management in projects

This standard provides guidance on the application of quality management in projects.

It is applicable to projects of varying complexity, small or large, of short or long duration, in different environments, and irrespective of the kind of product or process involved. This can necessitate some tailoring of the guidance to suit a particular project.

It is not a guide to “project management” itself. Guidance on quality in project management processes is discussed in this International Standard. Guidance on quality in a project’s product-related processes, and on the “process approach,” is covered in ISO 9004.

Because this standard is a guidance document, it is not intended to be used for certification/registration purposes.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=36643

ISO/TS 12033:2009 Electronic imaging—Guidance for selection of document image compression methods

This standard's revision, *ISO/CD TS 12033 Document management—Guidance for selection of document image compression methods*, is currently under development.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_detail_ics.htm?csnumber=42170

ISO/TR 12037:1998 Electronic imaging—Recommendations for the expungement of information recorded on write-once optical media

This standard applies to the removal of information recorded on write-once optical media systems when expungement is ordered by the court or administrative authority. Expungement requires specific removal actions to occur.

It establishes procedures for both information removal and documentation of the actions taken during removal. Following the recommendations contained in this Technical Report will ensure that the expungements are performed consistently.

Source: ANSI - American National Standards Institute - Web site

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2FTR+12037%3A1998>

ISO 12142:2001 Electronic imaging—Media error monitoring and reporting techniques for verification of stored data on optical digital data disks

This standard specifies two techniques for media error monitoring and reporting for the verification of data stored on optical digital data disks:

- high-level, which uses a set of functional commands; and
- SCSI-2 level, which uses a set of SCSI-2 commands.

It specifies two media error monitoring and reporting levels:

- system level, which uses a set of functional commands that can be used by the operating system, application software, and remote users; and
- optical disk device level, which uses a set of SCSI-2 commands that can be used by the device driver or a device application programme.

It applies to both rewritable and read only optical disk media.

Part of the information in this standard may be useful for CD-ROM subsystems, but implementations for that technology are beyond the scope of this International Standard.

Source: ANSI - American National Standards Institute - Web site

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12142%3a2001>

ISO 12199: 2000 Alphabetical ordering of multilingual terminological and lexicographical data represented in the Latin alphabet

This standard specifies the sequence of characters to be used in the alphabetical ordering of multilingual terminological or lexicographical data (terms, term elements, or words) represented in the Latin alphabet. Character sets of languages represented in the Latin alphabet are taken into account insofar as terminological or lexicographical data have been recorded. Character sets used in internationally standardized transliteration into Latin script are also taken into account.

The sequence of alphabetical characters given is intended for multilingual purposes only and is not intended to affect the alphabetical order of any specific language. The main part of this International Standard specifies letter-by-letter ordering of character strings. Normative annex A treats word-by-word ordering, which is a widely used alternative to this system.

Source: “Scope” of the standard at <http://anubis.dkuug.dk/jtc1/sc22/wg20/docs/n720.pdf>

ISO 12234-1:2007 Electronic still-picture imaging—Removable memory—Part 1: Basic removable-memory model

This standard specifies a basic removable-memory reference model for digital electronic still-picture cameras. The reference model includes image file formats for storing image data and metadata, filing system requirements for storing and retrieving the image files on the removable memory, and media profiles which are specific to a given storage technology. The reference model allows the image data and metadata to be interchanged among the various components of an electronic imaging system by using the removable storage media.

This standard revises ISO 12234-1:2001.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=42294

ISO/TR 12654:1997 Electronic imaging—Recommendations for the management of electronic recording systems for the recording of documents that may be required as evidence, on WORM optical disk

This standard makes recommendations to be followed in establishing procedures for the capture and storage of electronic images of documents that will ensure the preservation and integrity of the information recorded on the documents.

It applies to optical storage systems that use only media of a non-reversible Write-Once-Read-Many (WORM) type including compact disk (CD-ROM) to store electronic images of documents. It does not apply to systems that allow an image to be erased or altered after capture.

Source: ANSI - American National Standards Institute - Web site

<http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2fTR+12654%3a1997>

ISO/IEC 13250-2:2006 Information technology—Topic Maps—Part 2: Data model

This standard specifies the Topic Maps data model. It defines the abstract structure and interpretation of topic maps, the rules for merging topic maps and a set of fundamental subject identifiers.

The purpose of the data model is to define the interpretation of the Topic Maps interchange syntax, and to serve as a foundation for the definition of supporting standards for canonicalization, querying, constraints, etc.

This standard revises ISO/IEC 13250:2003.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=40017

See also: <http://www.isotopicmaps.org/TMMM/tmrm.1.33.pdf>

ISO/IEC 13250-3:2007 Information technology—Topic Maps—Part 3: XML syntax

This standard defines an extensible markup language (XML) vocabulary for interchanging topic maps. The interpretation of the syntax is defined through a mapping from the syntax to the Topic Maps data model defined in ISO/IEC 13250-2.

The vocabulary, known as XML Topic Maps (XTM) 2.0, is not designed to be extended or modified. Ease of human authoring was not a primary design goal, and consequently it is not recommended to edit the syntax directly.

XTM 2.0 is a revision of the XTM 1.0 vocabulary defined in ISO/IEC 13250:2003, which was adopted verbatim from the XML Topic Maps (XTM) 1.0 specification published by TopicMaps.Org in March 2001. The differences between the two versions are described.

This standard revises ISO/IEC 13250:2003.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=40018

See also: <http://www.isotopicmaps.org/sam/sam-xtm/2006-06-19/>

ISO/IEC 13335-1:2004 Information technology—Security techniques—Management of information and communications technology security—Part 1: Concepts and models for information and communications technology security management

This standard presents the concepts and models fundamental to a basic understanding of ICT security, and addresses the general management issues that are essential to the successful planning, implementation and operation of ICT security. Part 2 of ISO/IEC 13335 (currently 2nd WD) provides operational guidance on ICT security. Together these parts can be used to help identify and manage all aspects of ICT security.

This standard revises ISO/IEC TR 13335-1:1996 and ISO/IEC TR 13335-2:1997, but has since been withdrawn.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=39066

ISO 14721:2003 Space data and information transfer systems—Open archival information system—Reference model

This standard specifies a reference model for an open archival information system (OAIS). The purpose of this standard is to establish a system for archiving information, both digitalized and physical, with an organizational scheme composed of people who accept the responsibility to preserve information and make it available to a designated community.

This reference model addresses a full range of archival information preservation functions including ingest, archival storage, data management, access, and dissemination. It also addresses the migration of digital information to new media and forms, the data models used to represent the information, the role of software in information preservation, and the exchange of digital information among archives. It identifies both internal and external interfaces to the archive functions, and it identifies a number of high-level services at these interfaces. It provides various illustrative examples and some “best practice” recommendations. It defines a minimal set of responsibilities for an archive to be called an OAIS, and it also defines a maximal archive to provide a broad set of useful terms and concepts.

The OAIS model described in ISO 14721:2003 may be applicable to any archive. It is specifically applicable to organizations with the responsibility of making information available for the long term. This includes organizations with other responsibilities, such as processing and distribution in response to programmatic needs.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=24683

See also:

<http://www.pdfhost.com/view/aHR0cDovL2FwYW4ubmV0L211ZXRpbmdzL2NhaXJuczIwMDQvcHJlc2VudGF0aW9uL2VzY2llbmNILXVsbG1hbi5wcHQ=>

ISO/IEC 14888-3:2006 Information technology—Security techniques—Digital signatures with appendix—Part 3: Discrete logarithm based mechanisms

This standard specifies digital signature mechanisms with appendix whose security is based on the discrete logarithm problem. It provides a general description of a digital signature with appendix mechanism, and a variety of mechanisms that provide digital signatures with appendix.

For each mechanism, it specifies the process of generating keys, the process of producing signatures, and the process of verifying signatures.

The verification of a digital signature requires the signing entity's verification key. It is thus essential for a verifier to be able to associate the correct verification key with the signing entity, or more precisely, with (parts of) the signing entity's identification data. This association may be provided by another means that is not covered in ISO/IEC 14888-3:2006. Whatever the nature of such means, the scheme is then said to be "certificate-based." If not, the association between the correct verification key and the signing entity's identification data is somehow inherent in the verification key itself. In such a case, the scheme is said to be 'identity-based'. Depending on the two different ways of checking the correctness of the verification keys, the digital signature mechanisms specified in ISO/IEC 14888-3:2006 are categorized in two groups: certificate-based and identity-based.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=43656

ISO/IEC TR 15443-1:2005 Information technology—Security techniques—A framework for IT security assurance—Part 1: Overview and framework

This is a multi-part type 3 Technical Report to guide the IT security professional in the selection of an appropriate assurance method when specifying, selecting, or deploying a security service, product, or environmental factor such as an organization or personnel (known as a deliverable). The aim is to understand the assurance type and amount required to achieve confidence that the deliverable satisfies the stated IT security assurance requirements and consequently its security policy.

This technical report describes the fundamentals of security assurance and its relation to other security concepts. This is to clarify why security assurance is required and dispel common misconceptions such as that increased assurance is gained by increasing the strength of a security mechanism. The framework includes a categorization of assurance types and a generic lifecycle model to identify the appropriate assurance types required for the deliverable with respect to the deliverable's lifecycle. The model also demonstrates how security assurance must be managed throughout the deliverable's lifecycle requiring assurance decisions to be made by several assurance authorities for the lifecycle stage relevant to their organization (i.e., developer, standards and consumer). The framework has been developed to be general enough to accommodate different assurance types and map into any lifecycle approach so as not to dictate any particular design. Advanced security assurance

concepts, such as combining security assurance methods, are addressed briefly as they are to be addressed in later parts of ISO/IEC TR 15443.

This technical report targets IT security managers and other security professionals responsible for developing a security assurance program, engineering security into a deliverable, determining the security assurance of their deliverable, entering an assurance assessment audit (e.g., ISO 9000, SSE-CMM (ISO/IEC 21827), ISO/IEC 15408-3), or other assurance activities.

ISO/IEC TR 15443-2:2005 Information technology—Security techniques—A framework for IT security assurance—Part 2: Assurance methods

This technical report describes a variety of IT security assurance methods and approaches and relates them to the IT security assurance framework in ISO/IEC TR 15443-1. The emphasis is to identify qualitative properties of the assurance methods and elements that contribute to assurance, and where possible, to define assurance ratings. This material is intended for IT security professionals for the understanding of how to obtain assurance in a given life-cycle stage of a product or service.

The objective is to describe and categorize assurance methods and approaches in a manner enabling a review of their comparable and synergetic properties. This will facilitate selection of the appropriate assurance method or and possible combination of assurance methods for a given IT security product, system, or service and its specific environment.

ISO/IEC TR 15443-3:2007 Information technology—Security techniques—A framework for IT security assurance—Part 3: Analysis of assurance methods

This technical report provides general guidance to an assurance authority in the choice of the appropriate type of international communications technology (ICT) assurance methods and to lay the framework for the analysis of specific assurance methods for specific environments.

It allows the user to match specific assurance requirements and/or typical assurance situations with the general characteristics offered by available assurance methods.

The guidance provided by this technical report is applicable to the development, implementation and operation of ICT product and ICT systems with security requirements.

The advice given in this technical report is qualitative and summary, and the user may need to analyse which methods presented in ISO/IEC TR 15443-2 will suit best his/her specific deliverables and organisational security requirements.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=41693

ISO/IEC 15444-1:2004 Information technology—JPEG 2000 image coding system: Core coding system

This standard defines a set of lossless (bit-preserving) and lossy compression methods for coding bi-level, continuous-tone grey-scale, palletized colour, or continuous-tone colour digital still images.

ISO/IEC 15444-1:2004 | ITU-T Rec. T.800

- specifies decoding processes for converting compressed image data to reconstructed image data;
- specifies a codestream syntax containing information for interpreting the compressed image data;
- specifies a file format;
- provides guidance on encoding processes for converting source image data to compressed image data; and
- provides guidance on how to implement these processes in practice.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=37674

See also: <http://www.jpeg.org/jpeg2000/CDs15444.html>

ISO/IEC 15445:2000 Information technology—Document description and processing languages—HyperText Markup Language (HTML)

The HyperText Markup Language (HTML) is an application of the International Standard ISO 8879—Standard Generalized Markup Language (SGML). It provides a simple way of structuring hypertext documents and of placing references in one document which point to another. This International Standard is a refinement of the World Wide Web Consortium's (W3C) Recommendation for HTML 4.0: it provides further rules to condition and refine the use of the W3C Recommendation in a way which emphasizes the use of stable and mature features, and represents accepted SGML practice. Documents which conform to this International Standard also conform to the strict DTD provided by the W3C Recommendation for HTML 4.01.

This standard makes a clear and important distinction between conforming systems and validating systems. A conforming system operates correctly when handling documents which conform to this International Standard, but is not required to operate correctly when the documents do not conform. A validating system is more powerful: it detects all SGML and HTML errors in a document. Frequently browsers are conforming systems whereas authoring tools check for validity.

This standard assumes that the reader is familiar with International Standard ISO 8879—Standard Generalized Markup Language (SGML).

Source: <https://www.cs.tcd.ie/15445/15445.html>

ISO 15489-1:2001 Information and documentation—Records management—Part 1: General

This part of ISO 15489 provides guidance on managing records of originating organizations, public or private, for internal and external clients. In some countries, the management of records also applies to archives management. Archives management is not covered in this part of ISO 15489.

All the elements outlined in this standard are recommended to ensure that adequate records are created, captured and managed. Procedures that help to ensure the management of records according to the principles and elements outlined in this part of ISO 15489 are provided in ISO/TR 15489-2.

Does not apply to the management of archival records within archival institutions.

Source: ISO Web site http://www.iso.org/iso/catalogue_detail?csnumber=31908

ISO 15489-2:2001 Information and documentation—Records management—Part 2: Guidelines

This part of ISO 15489 is an implementation guide to ISO 15489-1 for use by record management professionals and those charged with managing records in their organizations. It provides one methodology that will facilitate the implementation of ISO 15489-1 in all organizations that have a need to manage their records. It gives an overview of the processes and factors to consider in organizations wishing to comply with ISO 15489-1.

Source: “Scope” in its full text, which is available at http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=35845

ISO 15511:2003 Information and documentation—International standard identifier for libraries and related organizations

This standard defines and promotes the use of a set of standard identifiers for the unique identification of libraries and related organizations with a minimum impact on already existing systems.

Source: ISO Web site http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=27979

ISO 15706-2:2007 Information and documentation—International Standard Audiovisual Number (ISAN)—Part 2: Version identifier

This standard establishes a voluntary system for the identification of versions of audiovisual works and other content derived from or closely related to an audiovisual work. It is based on the International Standard Audiovisual Number (ISAN) system defined in ISO 15706:2002. An ISAN combined with the version segment, as specified in ISO 15706-2:2007, constitutes

an ISAN version identifier, is referred to as a V-ISAN. A V-ISAN is a registered, globally unique identifier for versions of an audiovisual work and related content.

A V-ISAN identifies a specific version or other content related to an audiovisual work throughout its life. It is intended for use wherever precise and unique identification of a specific version or other content related to an audiovisual work would be desirable, such as in audiovisual production and distribution systems, broadcasting applications and electronic program guides.

A V-ISAN identifies a specific version or other content related to an audiovisual work as the unique compound of its component elements (e.g., its artistic content, languages, editing and technical format) throughout its life and independent of any physical form in which that version or related content is distributed.

The assignment of a V-ISAN to a version or other content related to an audiovisual work does not constitute evidence of the ownership of rights to either that version or related content or to the audiovisual work itself.

This standard specifies the basic systems and procedures to support the issuance and administration of V-ISANs.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=35581

ISO 15707:2001 Information and documentation—International Standard Musical Work Code (ISWC)

This standard defines the format, administration and rules for allocating ISWC to musical works. The ISWC will uniquely distinguish musical works from one another within computer databases and related documentation and for the purposes of collecting societies involved in the administration of rights to musical works. Use of the unique ISWC identifier will improve efficiency in the administration of rights to musical works and reduce the possibility of errors when information about musical works is exchanged between rights societies, publishers, record companies and other interested parties on an international level.

Source: <http://www.collectionscanada.gc.ca/iso/tc46sc9/standard/3901e.htm>

ISO/TR 15801:2004 Electronic imaging—Information stored electronically—Recommendations for trustworthiness and reliability

This standard describes the implementation and operation of information management systems which store information electronically and where the issues of trustworthiness, reliability, authenticity and integrity are important. The whole life cycle of a stored electronic document is covered, from initial capture to eventual destruction.

This standard is intended for use with any information management system, including traditional document imaging, workflow and COLD/ERM technologies, and using any type of electronic storage medium including WORM and rewritable technologies.

This standard does not cover processes used to evaluate the authenticity of information prior to it being stored or imported into the system. However, it can be used to demonstrate that output from the system is a true reproduction of the original document.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=29093

ISO 15836:2003 Information and documentation—The Dublin Core metadata element set

This standard applies to the Dublin Core (DC) metadata element set, which deals with cross-domain information resource description. For DC applications, a resource will typically be an electronic document. ISO 15836:2003 is for the element set only, which is generally used in the context of a specific project or application. Local or community based requirements and policies may impose additional restrictions, rules, and interpretations. It is not the purpose of this standard to define the detailed criteria by which the element set will be used with specific projects and applications.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=37629

DC is the most widely used metadata standard for resource discovery. Developed by the Dublin Core Metadata Initiative (an open forum composed of individuals from diverse disciplines and from all over the world; see <http://www.dublincore.org/index.shtml>), DC is intended to be simple to use and general enough to be applied to resources in any discipline. DC defines the categories of information to record about a resource (such as a Web page, a document or an image) for the resource to be easily “discovered.” It has been approved as an ANSI standard (Z39.85-2001), an ISO standard (15836), and has been adopted within the Canadian, Australian and UK governments, among others.

There are various DC Working Groups (e.g., Education, Architecture, Administration, Collection Description, etc.; see <http://dublincore.org/groups>) working on the development of discipline-specific element sets to supplement the “core” elements. The DC Education Working Group has had an education-specific DC element set approved, with additional elements such as “Audience.”

The DC Metadata Initiative has drafted a Dublin Core Metadata Glossary (see <http://library.csun.edu/mwoodley/dublincoreglossary.html>), which may be helpful.

Source: Canadian Heritage Information Network (CHIN)

http://www.chin.gc.ca/English/Standards/metadata_discovery.html

ISO 15924:2004 Codes for the representation of names of scripts

This standard provides a code for the presentation of names of scripts. The codes were devised for use in terminology, lexicography, bibliography and linguistics, but they may be used for any application requiring the expression of scripts in coded form. Also includes guidance on the use of script codes in some of these applications.

Source: ISO Web site http://www.iso.org/iso/catalogue_detail?csnumber=29546

See also: <http://unicode.org/iso15924/iso15924-codes.html>

ISO/TR 18492:2005 Long-term preservation of electronic document-based information

This technical report provides practical methodological guidance for the long-term preservation and retrieval of authentic electronic document-based information, when the retention period exceeds the expected life of the technology (hardware and software) used to create and maintain the information.

This technical report takes into account the role of technology-neutral information technology standards in supporting long-term access.

It also acknowledges that ensuring the long-term preservation and retrieval of authentic electronic document-based information should involve IT specialists, document managers, records managers and archivists.

It does not cover processes for the creation, capture and classification of authentic electronic document-based information.

It applies to all forms of information generated by information systems and saved as evidence of business transactions and activities.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=38716

ISO 18925:2008 Imaging materials—Optical disc media—Storage practices

ISO 18925:2008 establishes extended-term storage conditions for optical discs and provides recommendations concerning the storage conditions, storage facilities, enclosures and inspection for optical discs. It is applicable to discs made for audio, video, instrumentation and computer use.

ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_detail_ics.htm?csnumber=51328

See also: <http://electronics.ihp.com/news/2008/iso-care-optical-discs-110508.htm> (provides basic information on the standard)

ISO 19005-1:2005 Document management—Electronic document file format for long-term preservation—Part 1: Use of PDF 1.4 (PDF/A-1)

This standard specifies how to use the Portable Document Format (PDF) 1.4 for long-term preservation of digital documents. It is applicable to documents containing combinations of character, raster and vector data.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=38920

See also: <http://www.digitalpreservation.gov/formats/fdd/fdd000125.shtml>

ISO 19115:2003 Geographic information—Metadata

This standard defines the schema required for describing geographic information and services. It provides information about the identification, the extent, the quality, the spatial and temporal schema, spatial reference, and distribution of digital geographic data.

It is applicable to:

- the cataloguing of datasets, clearinghouse activities, and the full description of datasets; and
- geographic datasets, dataset series, and individual geographic features and feature properties.

It defines:

- mandatory and conditional metadata sections, metadata entities, and metadata elements;
- the minimum set of metadata required to serve the full range of metadata applications (data discovery, determining data fitness for use, data access, data transfer, and use of digital data);
- optional metadata elements—to allow for a more extensive standard description of geographic data, if required; and
- a method for extending metadata to fit specialized needs.

Although this standard is applicable to digital data, its principles can be extended to many other forms of geographic data such as maps, charts, and textual documents as well as non-geographic data.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=26020

This standard was developed by the geospatial community to address specific issues relating to both the description and the curation of spatial data. This complex metadata standard can be used for describing digital or physical objects or datasets which have a spatial dimension. There are over 400 elements in the Data Dictionary, which are divided into 14 metadata packages. Each package supports a particular function, some are specific to spatial data and some deal with general description and data curation issues. Abstract models written in UML (Unified Modeling Language) are provided for most of the packages to help the implementer

understand how the elements interrelate. The standard also includes methodologies for creating application profiles, metadata extensions and hierarchical metadata and provides implementation examples. Geospatial professionals have developed a number of profiles of this standard to fit particular uses. One of these is UK GEMINI which defines an element set for discovery level metadata. It is also compliant with e-GMS and was developed collaboratively by the UK Association of Geographic Information (AGI) and the Cabinet Office e-Government Unit.

Source: Digital Curation Center (DCC) *Standards Watch* at <http://www.dcc.ac.uk/resource/standards-watch/what-are-metadata-standards>

ISO/TS 19139:2007 Geographic information—Metadata—XML schema implementation

This technical specification defines Geographic MetaData XML (gmd) encoding, an XML Schema implementation derived from ISO 19115.

Source: ISO Web site http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=32557

ISO/IEC 19757-2:2003 Information technology—Document Schema Definition Language (DSDL)—Part 2: Regular-grammar-based validation—RELAX NG

This standard specifies RELAX NG, a schema language for XML. A RELAX NG schema specifies a pattern for the structure and content of an XML document. The pattern is specified by using a regular tree grammar. A RELAX NG schema is itself an XML document.

It also specifies when an XML document is a correct RELAX NG schema; and when an XML document is valid with respect to a correct RELAX NG schema.

Source: ISO Web site http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=37605

See also: <http://www.open-std.org/jtc1/sc34old/repository/0661.pdf>

ISO/IEC 19757-3:2006 Information technology—Document Schema Definition Languages (DSDL)—Part 3: Rule-based validation—Schematron

This standard defines a set of Document Schema Definition Languages (DSDL) that can be used to specify one or more validation processes performed against Extensible Markup Language (XML) or Standard Generalized Markup Language (SGML) documents. (XML is an application profile SGML, ISO 8879:1986.)

It specifies Schematron, a rules-based schema language for XML. It establishes requirements for Schematron schemas and specifies when an XML document matches the patterns specified by a Schematron schema.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=40833

ISO/IEC 19757-4:2006 Information technology—Document Schema Definition Languages (DSDL)—Part 4: Namespace-based Validation Dispatching Language (NVDL)

This standard specifies a Namespace-based Validation Dispatching Language (NVDL). An NVDL script controls the dispatching of elements or attributes in a given XML document to different validators, depending on the namespaces of the elements or attributes. An NVDL script also specifies which schemas are used by these validators. These schemas may be written in any schema languages, including those specified by ISO/IEC 19757.

Source:

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=38615

ISO 20652:2006 Space data and information transfer systems—Producer-archive interface—Methodology abstract standard

This standard identifies, defines and provides structure to the relationships and interactions between an information producer and an archive. It defines the methodology for the structure of actions that are required from the initial time of contact between the producer and the archive until the objects of information are received and validated by the archive. These actions cover the first stage of the ingest process as defined in the open archival information system (OAIS) reference model (see ISO 14721). It describes parts of the functional entities administration (“negotiate submission agreement”) and ingest (“receive submission” and “quality assurance”).

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=39577

ISO/IEC 21000-3:2003 Information technology—Multimedia framework (MPEG-21)—Part 3: Digital Item Identification

This standard defines an open framework for multimedia delivery and consumption, with both the content creator and content consumer as focal points. The vision for MPEG-21 is to define a multimedia framework to enable transparent and augmented use of multimedia resources across a wide range of networks and devices used by different communities.

The basic architectural concept in MPEG-21 is the Digital Item. Digital Items are structured digital objects, including a standard representation and identification, and metadata. They are the basic unit of transaction in the MPEG-21 framework. Many MPEG-21 applications have the requirement to uniquely identify Digital Items.

This standard provides a simple but flexible mechanism to:

- uniquely identify Digital Items and parts thereof (including resources);

- uniquely identify IP related to the Digital Items (and parts thereof), for example abstractions;
- uniquely identify Description Schemes; and
- use identifiers to link Digital Items with related information such as descriptive metadata (non-normative).

The DII specification does not specify new identification systems for the content elements for which identification and description schemes already exist and are in use.

Identifiers covered by this specification can be associated with Digital Items by including them in a specific place in the Digital Item Declaration (ISO/IEC 21000-2).

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=35367

ISO/IEC 21000-6:2004 Information technology—Multimedia framework (MPEG-21)— Part 6: Rights Data Dictionary

This standard describes a Rights Data Dictionary which comprises a set of clear, consistent, structured, integrated and uniquely identified terms to support the MPEG-21 Rights Expression Language (REL), ISO/IEC 21000-5. Annex A specifies the methodology for and structure of the RDD Dictionary, and specifies how further Terms may be defined under the governance of a Registration Authority, requirements for which are described in Annex C.

Taken together, these specifications and the RDD Dictionary and Database make up the RDD System. Use of the RDD System will facilitate the accurate exchange and processing of information between interested parties involved in the administration of rights in, and use of, Digital Items, and in particular it is intended to support ISO/IEC 21000-5 (REL). Clause 6 describes how ISO/IEC 21000-6:2004 relates to ISO/IEC 21000-5.

As well as providing definitions of terms for use in ISO/IEC 21000-5, the RDD System is designed to support the mapping of terms from different namespaces. Such mapping will enable the transformation of metadata from the terminology of one namespace (or Authority) into that of another namespace. Mapping, to ensure minimum ambiguity or loss of semantic integrity, will be the responsibility of the Registration Authority. Provision of automated term look-up is also a requirement.

The RDD Dictionary is a prescriptive dictionary, in the sense that it defines a single meaning for a term represented by a particular RddAuthorized TermName, but it is also inclusive in that it can recognize the prescription of other Headwords and definitions by other Authorities and incorporates them through mappings. The RDD Dictionary also supports the circumstance that the same name may have different meanings under different Authorities. ISO/IEC 21000-6:2004 describes audit provisions so that additions, amendments and deletions to Terms and their attributes can be tracked.

Recognizes legal definitions as and only as Terms from other Authorities that can be mapped into the RDD Dictionary. Therefore Terms that are directly authorized by the RDD Registration Authority neither define nor prescribe intellectual property rights or other legal entities.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=36096

ISO 21127:2006 Information and documentation—A reference ontology for the interchange of cultural heritage information

This standard establishes guidelines for the exchange of information between cultural heritage institutions. In simple terms this can be defined as the curated knowledge of museums.

A more detailed definition can be articulated by defining both the intended scope, a broad and maximally inclusive definition of general principles, and the practical scope, which is defined by reference to a set of specific museum documentation standards and practices.

The intended scope of this standard is defined as the exchange and integration of heterogeneous scientific documentation relating to museum collections. This definition requires further elaboration:

- The term “scientific documentation” is intended to convey the requirement that the depth and quality of descriptive information that can be handled by ISO 21127:2006 need be sufficient for serious academic research. This does not mean that information intended for presentation to members of the general public is excluded, but rather that ISO 21127:2006 is intended to provide the level of detail and precision expected and required by museum professionals and researchers in the field.
- The term “museum collections” is intended to cover all types of material collected and displayed by museums and related institutions, as defined by ICOM. This includes collections, sites, and monuments relating to fields such as social history, ethnography, archaeology, fine and applied arts, natural history, history of sciences and technology.
- The documentation of collections includes the detailed description of individual items within collections, groups of items and collections as a whole. ISO 21127:2006 is specifically intended to cover contextual information (i.e., the historical, geographical, and theoretical background that gives museum collections much of their cultural significance and value).
- The exchange of relevant information with libraries and archives, and harmonization with their models, falls within the intended scope of ISO 21127:2006.
- Information required solely for the administration and management of cultural institutions, such as information relating to personnel, accounting, and visitor statistics, falls outside the intended scope of ISO 21127:2006.

The practical scope of this standard is the set of reference standards for museum documentation that have been used to guide and validate its development. It covers the same

domain of discourse as the union of these reference documents; this means that data correctly encoded according to any of these reference documents can be expressed in a compatible form, without any loss of meaning.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=34424

See also: http://cidoc.icom.museum/standard_crm%28en%29%28E1%29.xml

ISO 22310:2006 Information and documentation—Guidelines for standards drafters for stating records management requirements in standards

This standard allows the appropriate incorporation of records requirements, according to ISO 15489-1, ISO/TR 15489-2 and 23081-1, which are applicable to all standards that require the creation and retention of records, into other standards. It also highlights the different elements that need to be considered as components of a comprehensive records management framework.

This guidance is in addition to the procedures for technical work and the methodology for the development of International Standards established by the ISO/IEC Directives.

This standard is intended for use by all ISO bodies involved in the development of records management or documentation requirements in standards. It can also be used by non-ISO standards development organizations at the international, regional or national level, which are considering or are in the process of developing records management requirements in standards and/or comparable documents.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=40899

ISO/IEC 23001-1:2006 Information technology—MPEG systems technologies—Part 1: Binary MPEG format for XML

This standard provides a standardized set of generic technologies for encoding XML documents. It addresses a broad spectrum of applications and requirements by providing generic methods for transmitting and compressing XML documents.

It also provides a specification that gives rules for the preparation of XML documents for efficient transport and storage, and enables the development of ISO/IEC 23001-1 terminals to receive, decode and assemble possibly partitioned and compressed XML documents.

The binary MPEG format for XML relies on schema knowledge between encoder and decoder in order to reach high compression efficiency, while providing fragmentation mechanisms for ensuring transmission and processing flexibility. Also defines means to compile and transmit schema knowledge information to enable the decoding of compressed XML documents without a priori schema knowledge at the receiving terminal.

The binary MPEG format for XML is described in four main sections:

- System Architecture presents the architecture of an ISO/IEC 23001-1-compliant terminal and general characteristics of an ISO/IEC 23001-1 decoder, such as decoder behaviour.
- Binary Format specifies binary syntax and associated semantics of the structural elements. In particular, this section describes the structure of a binary access unit.
- Binary Fragment Update Payload specifies binary syntax and associated semantics of the payload content. In particular, this section describes the decoding process of complex Type content using finite state automaton decoders.
- Advanced Optimized Decoders describes the mechanisms for decoding simple types of an XML document using advanced optimised decoders.

The binary format for XML described in this specification can be used for encoding MPEG-7 and MPEG-21 descriptions, as specified in ISO/IEC 15938-1 (MPEG-7 Systems) and 21000-16 (MPEG-21 Binary Format), respectively.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=35417

ISO 23081-1:2006 Information and documentation—Records management processes—Metadata for records—Part 1: Principles

This standard covers the principles that underpin and govern records management metadata. These principles apply through time to:

- records and their metadata;
- all processes that affect them;
- any system in which they reside;
- any organization that is responsible for their management.

This standard revises: ISO/TS 23081-1:2004.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=40832

ISO/TS 23081-2:2007 Information and documentation—Records management processes—Metadata for records—Part 2: Conceptual and implementation issues

This technical specification establishes a framework for defining metadata elements consistent with the principles and implementation considerations outlined in ISO 23081-1:2006. The purpose of this framework is to:

- enable standardized description of records and critical contextual entities for records;
- provide common understanding of fixed points of aggregation to enable interoperability of records, and information relevant to records, between organizational systems; and
- enable re-use and standardization of metadata for managing records over time, space and applications.

It further identifies some of the critical decision points that need to be addressed and documented to enable implementation of metadata for managing records. It aims to:

- identify the issues that need to be addressed in implementing metadata for managing records;
- identify and explain the various options for addressing the issues; and
- identify various paths for making decisions and choosing options in implementing metadata for managing records.

This technical specification is revised by: **ISO/DIS 23081-2:2009 Information and documentation—Records management processes for Metadata—Part 2: Conceptual and implementation issues.**

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=43390 & http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_detail_ics.htm?csnumber=50863

ISO/IEC 26300:2006 Information technology—Open Document Format for Office Applications (OpenDocument) v1.0

This standard defines an XML schema for office applications and its semantics. The schema is suitable for office documents, including text documents, spreadsheets, charts and graphical documents like drawings or presentations, but is not restricted to these kinds of documents.

It provides for high-level information suitable for editing documents. It defines suitable XML structures for office documents and is friendly to transformations using XSLT or similar XML-based tools.

This standard first provides an introduction to the OpenDocument format and explains the structure of documents that conform to the OpenDocument specification. It describes the meta-information that can be contained in such documents, and their text and paragraph content. Text Fields and text indices are described.

This standard also describes the table content of a document in OpenDocument format, its graphical content, its chart content and its form content. It also describes content that is common to all documents. It describes the integration of SMIL animation markup into the OpenDocument schema. It explains style information content and specifies formatting properties that can be used within styles. The data types used by the OpenDocument schema are described. The OpenDocument format makes use of a package concept; these packages are described.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=43485)

ISO/WD 26324 Information and documentation—Digital object identifier system

The Document Object Identifier (DOI) system is currently being standardised through ISO. It is expected that the process will be finalised during 2008.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=43506
and the DOI Web site http://www.doi.org/about_the_doi.html#standards

ISO/IEC 27001:2005 Information technology—Security techniques—Information security management systems—Requirements

This standard covers all types of organizations (e.g., commercial enterprises, government agencies, not-for profit organizations). It specifies the requirements for establishing, implementing, operating, monitoring, reviewing, maintaining and improving a documented Information Security Management System within the context of the organization's overall business risks. It also specifies requirements for the implementation of security controls customized to the needs of individual organizations or parts thereof.

This standard is designed to ensure the selection of adequate and proportionate security controls that protect information assets and give confidence to interested parties.

It is intended to be suitable for several different types of use, including the following:

- use within organizations to formulate security requirements and objectives;
- use within organizations as a way to ensure that security risks are cost effectively managed;
- use within organizations to ensure compliance with laws and regulations;
- use within an organization as a process framework for the implementation and management of controls to ensure that the specific security objectives of an organization are met;
- definition of new information security management processes;
- identification and clarification of existing information security management processes;
- use by the management of organizations to determine the status of information security management activities;
- use by the internal and external auditors of organizations to determine the degree of compliance with the policies, directives and standards adopted by an organization;
- use by organizations to provide relevant information about information security policies, directives, standards and procedures to trading partners and other organizations with whom they interact for operational or commercial reasons;
- implementation of business-enabling information security; and
- use by organizations to provide relevant information about information security to customers.

Source: ISO Web site http://www.iso.org/iso/catalogue_detail?csnumber=42103

ISO/IEC 27002:2005 Information technology—Security techniques—Code of practice for information security management

This standard comprises ISO/IEC 17799:2005 and ISO/IEC 17799:2005/Cor.1:2007. Its technical content is identical to that of ISO/IEC 17799:2005. ISO/IEC 17799:2005/Cor.1:2007 changes the reference number of the standard from 17799 to 27002.

It establishes guidelines and general principles for initiating, implementing, maintaining, and improving information security management in an organization. The objectives outlined provide general guidance on the commonly accepted goals of information security management. Contains best practices of control objectives and controls in the following areas of information security management:

- security policy;
- organization of information security;
- asset management;
- human resources security;
- physical and environmental security;
- communications and operations management;
- access control;
- information systems acquisition, development and maintenance;
- information security incident management;
- business continuity management; and
- compliance.

The control objectives and controls in this standard are intended to be implemented to meet the requirements identified by a risk assessment. It is intended as a common basis and practical guideline for developing organizational security standards and effective security management practices, and to help build confidence in inter-organizational activities.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_detail_ics.htm?csnumber=50297

ISO/IEC 27006:2007 Information technology—Security techniques—Requirements for bodies providing audit and certification of information security management systems

This standard specifies requirements and provides guidance for bodies providing audit and certification of an information security management system (ISMS), in addition to the requirements contained within ISO/IEC 17021 and ISO/IEC 27001. It is primarily intended to support the accreditation of certification bodies providing ISMS certification.

The requirements contained in this standard need to be demonstrated in terms of competence and reliability by any body providing ISMS certification, and the guidance contained in ISO/IEC 27006:2007 provides additional interpretation of these requirements for any body providing ISMS certification.

Source: ISO Web site

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=42505

2.3 Standards by Other International Organizations

Note: Listed in alphabetical order.

Adobe Developers Association. Tagged Image File Format (TIFF) Revision 6.0

This document describes TIFF, a tag-based file format for storing and interchanging raster images.

TIFF describes image data that typically comes from scanners, frame grabbers, and paint- and photo-retouching programs.

TIFF is not a printer language or page description language. The purpose of TIFF is to describe and store raster image data.

A primary goal of TIFF is to provide a rich environment within which applications can exchange image data. This richness is required to take advantage of the varying capabilities of scanners and other imaging devices.

Although TIFF is a rich format, it can easily be used for simple scanners and applications as well because the number of required fields is small.

TIFF is capable of describing bilevel, grayscale, palette-color, and full-color image data in several color spaces.

TIFF includes a number of compression schemes that allow developers to choose the best space or time tradeoff for their applications.

TIFF is not tied to specific scanners, printers, or computer display hardware.

TIFF is portable. It does not favour particular operating systems, file systems, compilers, or processors.

TIFF is designed to be extensible—to evolve gracefully as new needs arise.

TIFF allows the inclusion of an unlimited amount of private or special-purpose information.

TIFF will be enhanced on a continuing basis as new imaging needs arise. A high priority has been given to structuring TIFF so that future enhancements can be added without causing unnecessary hardship to developers.

Source: Adobe site <http://partners.adobe.com/public/developer/en/tiff/TIFF6.pdf>

AIIM (Enterprise Content Management Association). Analysis, Selection, and Implementation Guidelines Associated with Electronic Document Management Systems (EDMS), 2007

(full text at <http://www.aiim.org/documents/standards/arp1-2007.pdf>)

This industry recommended practice presents a set of procedures and activities that should be

considered and/or performed during all aspects of analyzing, selecting, and implementing electronic document management systems. This document provides a categorization of relevant national and international standards and reports, enabling users and organizations to quickly identify and locate required information for all aspects of the EDMS project.

Source: “Abstract”

AIIM (Association for Information and Image Management) Document Management Alliance (DMA) 1.0 Specification

DMA 1.0, the most significant electronic document management standards, is a technical standard that outlined the software interfaces required to support interoperability among proprietary electronic document management software systems from different vendors. The standard defines requirements for both client and server sides of computing infrastructures and addresses Internet/ intranet architectures. Because it supports international multi-language conventions, it is also language-independent. DMA 1.0 was a milestone in the development of electronic document management technologies and their global deployment.

Source: Stephens, David O. <http://www.allbusiness.com/professional-scientific/management-consulting-services/541806-1.html>

The Document Management Alliance (DMA) is an AIIM Task Force with the charter to develop a uniform programming model enabling enterprise-wide interoperability among document-oriented application programs and document management systems (DM systems) from different vendors. The primary product of DMA is a specification for an integration model and interfaces by which applications and services from a rich variety of sources can integrate into a document-management solution. The members of DMA include a diverse group of DMS vendor companies, end user companies, governmental agencies, industry analysts and consultants, and industry press.

The DMA Task Force and the DMA architecture exist because of a shared vision among users and vendors of document management systems. The DMA vision is best described as a software architecture that allows unification of all document management systems and document-aware application programs in an enterprise, regardless of vendor, hardware platform, or software platform, into one seamless document management system spanning the enterprise. This vision rewards users with uniform access to any document, any format, anywhere across an enterprise, despite the existence of “islands of information”—that is, despite separate departmental document management systems and document-aware applications from different vendors which do not work together in the absence of the unifying architecture specified by DMA.

The DMA vision is realized in this specification as an object-oriented programming framework that document management vendors, integrators, and developers can use to provide their customers and users with the following capabilities:

- uniform access to any document, anywhere in an enterprise;
- self-describing systems and documents for ease of setup and configuration;

- scalable document management solutions from legacy systems to fully-featured, state-of-the-art document management systems;
- expanded collaboration opportunities; and
- high-level integration of services and applications.

Source: DMA <http://dmatech.info/dma1.0-7/>

AIIM (Association for Information and Image Management) Open Document Management API (ODMA)

The ODMA simplifies integration and interoperability of standard desktop applications with document management systems. Using ODMA, desktop applications access and manipulate documents carried in document management systems as easily as if they are residing in the locally-accessible file system.

Source: ODMA Web site <http://odma.info/>

Its main difference from the DMA standard mentioned above is that it is client side only. Since its issuance, ODMA has enjoyed widespread adoption by vendors in the electronic document management community.

Source: Stephens, David O. <http://www.allbusiness.com/professional-scientific/management-consulting-services/541806-1.html>

IEEE (Institute of Electrical and Electronics Engineers) LTSC (Learning Technology Standards Committee)—LOM (Learning Object Metadata)

This standard will specify the syntax and semantics of Learning Object Metadata, defined as the attributes required to fully/adequately describe a Learning Object. Learning Objects are defined here as any entity, digital or non-digital, which can be used, re-used or referenced during technology supported learning. Examples of technology supported learning include computer-based training systems, interactive learning environments, intelligent computer-aided instruction systems, distance learning systems, and collaborative learning environments. Examples of Learning Objects include multimedia content, instructional content, learning objectives, instructional software and software tools, and persons, organizations, or events referenced during technology supported learning. The Learning Object Metadata standards will focus on the minimal set of attributes needed to allow these Learning Objects to be managed, located, and evaluated. The standards will accommodate the ability for locally extending the basic fields and entity types, and the fields can have a status of obligatory (must be present) or optional (maybe absent). Relevant attributes of Learning Objects to be described include type of object, author, owner, terms of distribution, and format. Where applicable, Learning Object Metadata may also include pedagogical attributes such as; teaching or interaction style, grade level, mastery level, and prerequisites. It is possible for any given Learning Object to have more than one set of Learning Object Metadata. The standard will support security, privacy, commerce, and evaluation, but only to the extent that metadata fields will be provided for specifying descriptive tokens related to

these areas; the standard will NOT concern itself with how these features are implemented. We expect these standards will conform to, integrate with, or reference existing open standards and existing work in related areas. For example core Attributes of Learning Objects will be coordinated with or may simply defer to, the efforts to standardize content objects in general.

Source: IEEE Web site <http://ltsc.ieee.org/wg12/index.html>

ARMA International. Vital Records: Identifying, Managing, and Recovering Business-Critical Records

This American National Standards Institute (ANSI) standard (ANSI/ARMA 5-2003) sets the requirements for establishing a vital records program. It includes requirements for:

- identifying and protecting vital records;
- assessing and analyzing their vulnerability; and
- determining the impact of their loss on the organization.

Prepared for the use and guidance of those charged with planning, surveying, classifying, retaining, and protecting vital records, this publication also includes salvage information for various media and sample records classification chart, vital records schedule, and risk assessment site survey. (It supersedes the 1993 Vital Records guideline, ARMA Catalogue # A4543.)

Source: ARMA site <https://www.arma.org/bookstore/productdetail.cfm?ProductID=1276>

ARMA International. Requirements for Managing Electronic Messages as Records

This American national standard defines requirements for developing a corporate policy for managing information content in any type of text-based electronic message or communication such as e-mail or instant messaging. It also includes recommended provisions for an electronic message records management policy useful throughout the lifecycle from message creation to final destruction or disposition.

ANSI/ARMA 9-2004 approved as American National Standards Institute (ANSI) standard on Oct. 7, 2004.

(Note: this standard is selected because of the ARMA's international constitution).

Source: ARMA site <https://www.arma.org/bookstore/productdetail.cfm?ProductID=1499>

ARMA International Standards Development Committee Task Force. Procedures and Issues for Managing Electronic Messages as Records

This technical report (ANSI/ARMA TR-02-2007) will be of great value to those who must deal with practical managerial issues typically confronted during the implementation and

management of any text-based electronic messaging system or communication, such as e-mail or instant messaging (but excluding voice mail).

Although it was developed as an implementation guideline for ANSI/ARMA 9-2004 standard, *Requirements for Managing Electronic Messages as Records*, users also will find it a useful companion resource to ISO, ANSI, DoD, and other standards.

The technical report addresses privacy, confidentiality, security, electronic message policy compliance, appropriate use, legal considerations, and disaster recovery.

Additional content includes metadata requirements and procedures for handling attachments, drafts, copies, duplicates, appraisal and classification, preservation, and disposition or destruction of electronic messages classified as records. Systems support staff will find the model audit checklist a useful tool to evaluate an electronic message management program.

ANSI/ARMA TR-02-2007 approved as a technical report by the American National Standards Institute August 26, 2007.

Source: ARMA site <http://www.arma.org/bookstore/productdetail.cfm?ProductID=2268>

ARMA International Standards Development Committee Task Force. The Digital Records Conversion Process: Program Planning, Requirements, Procedures

This ANSI/ARMA standard provides requirements for ensuring that electronic records remain authentic and trustworthy as they are converted from one digital recordkeeping system to another. Though it does not address digital preservation, there is a substantial link between conversion and digital preservation, as many preservation strategies involve some type of conversion process.

Part I of the standard addresses the decisions relating to program planning and recordkeeping issues. Part II discusses the actual conversion process.

Appended are tables, a template that draws together recordkeeping requirements, the risks/drivers impinging on the process, the controls, and the stages of the conversion process, and other tools designed to aid records professionals and others assigned the conversion task.

Using this standard in conjunction with the international standard *ISO 14721:2003, Space data and information transfer systems—Open archival information system—Reference model* will provide substantial background and contextual information to better inform the issues addressed in the standard.

Source: <http://www.arma.org/bookstore/productdetail.cfm?ProductID=2228>

ARMA International Standards Task Force. Establishing Alphabetic, Numeric, Subject Filing Systems

This standard is intended to aid in the selection and application of a filing system that will enable users to retrieve information when needed. It describes three principal systems: alphabetic filing, subject filing, and numeric filing. In addition, it contains standard rules for indexing alphabetic data.

Used correctly, this standard will establish a uniform files classification system that makes sense to the users while identifying and preserving a set order of records. Three informative appendices include instructions for indexing, factors to consider when using automated indexing systems, and exceptions for alphabetic indexing.

Note: This consolidated standard replaces the Alphabetic Filing Rules standard.

Source: ARMA Web site

<https://www.arma.org/bookstore/productdetail.cfm?ProductID=1519>

ARMA International Standards Task Force. Revised Framework for Integration of EDMS & ERMS Systems (ANSI/AIIM/ARMA TR48-2006)

This technical report defines, describes, and differentiates the two most common types of information systems used to manage electronic document-based information using current technology—electronic document management systems (EDMS) and electronic records management systems (ERMS)—and provides a framework for their integration.

It presents an integrated EDMS/ERMS top-level reference model and describes general approaches to implementing the model. The report also includes a bibliography, references, acronyms, and definitions.

Revisions for this 2006 publication consist principally of changes to the parts of Sections 7 and 9 pertaining to metadata.

The following topics are beyond the scope of this report:

- functional requirements for systems development. Organizations developing an integrated EDMS/ERMS will need to address the regulatory environment in which they operate;
- specific integration requirements between ERMS and other EDMS components of the ECM environment;
- recommended specific technical standards;
- recommended policy, procedure, or best practice;
- any new technical standards;
- specific technical architectures (e.g., client/server or N-tier); and
- archival management of records (this report reaches only to the point of transfer of records to archives).

In summary, the implementation approaches are general, high-level, and independent of technical implementation.

Source: ARMA Web site

<http://www.arma.org/bookstore/productdetail.cfm?ProductID=1479>

ARMA International Standards Task Force. Retention Management for Records and Information

This standard provides guidance for establishing and operating a retention and disposition program as a component of a complete records and information management program. It covers general principles, including the following:

- authority and responsibility;
- identifying and classifying records for retention purposes; and
- principles for determining retention periods for all records on all media and in all formats.

When implemented, the information retention and disposition program will help ensure compliance with operational, legal/regulatory, fiscal, archival, and other requirements by defining:

- periods of time for which records are to be maintained;
- appropriate methods for disposition of records; and
- measures to be taken when disposition must be suspended.

Source: ARMA Web site

<https://www.arma.org/bookstore/productdetail.cfm?ProductID=1529>

IETF (The Internet Engineering Task Force) RFC 2821 Simple Mail Transfer Protocol

The IETF is a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. It is open to any interested individual.

The objective of the Simple Mail Transfer Protocol (SMTP) is to transfer mail reliably and efficiently.

SMTP is independent of the particular transmission subsystem and requires only a reliable ordered data stream channel. While this document specifically discusses transport over TCP, other transports are possible.

An important feature of SMTP is its capability to transport mail across networks, usually referred to as “SMTP mail relaying”. A network consists of the mutually-TCP-accessible hosts on the public Internet, the mutually-TCP-accessible hosts on a firewall-isolated TCP/IP Intranet, or hosts in some other LAN or WAN environment utilizing a non-TCP transport-level protocol. Using SMTP, a process can transfer mail to another process on the same network or to some other network via a relay or gateway process accessible to both networks.

In this way, a mail message may pass through a number of intermediate relay or gateway hosts on its path from sender to ultimate recipient. The Mail eXchanger mechanisms of the domain name system are used to identify the appropriate next-hop destination for a message being transported.

Source: IETF Web site <http://www.apps.ietf.org/rfc/rfc2821.html>

ietf (The Internet Engineering Task Force) RFC 2822 Internet Message Format

This standard specifies a syntax for text messages that are sent between computer users, within the framework of “electronic mail” messages. This standard supersedes the one specified in Request For Comments (RFC) 822, “Standard for the Format of ARPA Internet Text Messages,” updating it to reflect current practice and incorporating incremental changes that were specified in other RFCs.

This standard specifies a syntax only for text messages. In particular, it makes no provision for the transmission of images, audio, or other sorts of structured data in electronic mail messages. There are several extensions published, such as the MIME document series, which describe mechanisms for the transmission of such data through electronic mail, either by extending the syntax provided here or by structuring such messages to conform to this syntax. Those mechanisms are outside of the scope of this standard.

In the context of electronic mail, messages are viewed as having an envelope and contents. The envelope contains whatever information is needed to accomplish transmission and delivery. The contents comprise the object to be delivered to the recipient. This standard applies only to the format and some of the semantics of message contents. It contains no specification of the information in the envelope.

However, some message systems may use information from the contents to create the envelope. It is intended that this standard facilitate the acquisition of such information by programs.

This specification is intended as a definition of what message content format is to be passed between systems. Though some message systems locally store messages in this format (which eliminates the need for translation between formats) and others use formats that differ from the one specified in this standard, local storage is outside of the scope of this standard.

Note: This standard is not intended to dictate the internal formats used by sites, the specific message system features that they are expected to support, or any of the characteristics of user interface programs that create or read messages. In addition, this standard does not specify an encoding of the characters for either transport or storage; that is, it does not specify the number of bits used or how those bits are specifically transferred over the wire or stored on disk.

ITU (International Telecommunication Union) X.667: 2004 Information technology—Open Systems Interconnection—Procedures for the operation of OSI Registration Authorities:

Generation and registration of Universally Unique Identifiers (UUIDs) and their use as ASN.1 object identifier components

The ITU is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis. In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

This Recommendation | International Standard specifies the format and generation rules that enable users to produce 128-bit identifiers that are either guaranteed to be globally unique, or are globally unique with a high probability.

The UUIDs generated in conformance with this Recommendation | International Standard are suitable either for transient use, with generation of a new UUID every 100 nanoseconds, or as persistent identifiers.

This Recommendation | International Standard specifies the procedures for the operation of a Web-based Registration Authority for UUIDs.

This Recommendation | International Standard also specifies and allows the use of UUIDs (registered or not registered) to form a URN (Uniform Resource Name).

Source: "Introduction" and "Scope" in full text of the standard available at <http://www.itu.int/ITU-T/studygroups/com17/oid/X.667-E.pdf>

ITU (International Telecommunication Union) X.509 : Information technology—Open Systems Interconnection—The Directory: Public-key and attribute certificate frameworks

The ITU is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

This Recommendation | International Standard defines a framework for public-key certificates and attribute certificates.

These frameworks may be used by other standards bodies to profile their application to Public Key Infrastructures (PKI) and Privilege Management Infrastructures (PMI). Also, this Recommendation | International Standard defines a framework for the provision of authentication services by Directory to its users. It describes two levels of authentication: simple authentication, using a password as a verification of claimed identity; and strong authentication, involving credentials formed using cryptographic techniques. While simple

authentication offers some limited protection against unauthorized access, only strong authentication should be used as the basis for providing secure services.

Source: ITU Web site <http://www.itu.int/rec/T-REC-X.509-200003-I/en>

European Commission. MoReq2 Specification (Model Requirements for the Management of Electronic Records: Update and Extension) 2008

(full text at <http://www.moreq2.eu/>)

MoReq2 was prepared for the European Commission by Serco Consulting with financing from the European Union's IDABC programme. The development process was overseen by the European Commission working closely with the DLM Forum and drafts were reviewed by DLM Forum experts at key stages in the development. These reviews were in addition to input and review by dozens of users, consultants, suppliers, academics and professional bodies from around the globe, giving MoReq2 an unprecedented level of authority. As such MoReq2 will be of great value to all those involved in the management of electronic records in Europe and around the world.

This new version of MoReq, called MoReq2, addresses the impacts of that technological change. It also takes account of new standards and best practice that have been developed over the last several years. Accordingly, it is written as an evolutionary update of the original MoReq.

MoReq2 for the first time also allows for a software testing regime to be implemented. It is written specifically to support the execution of independent compliance testing and a suite of compliance tests has been developed and published in parallel with the model requirements themselves. The need for rigorously-worded, testable, requirements has led to many changes of wording and expression in MoReq2.

The years of experience in using and applying MoReq has pointed out the need for national variations, to take into account different national languages, legislation, regulations, and record keeping traditions. For this reason, MoReq2 introduces for the first time a moderated mechanism—called “chapter zero”—to allow member states to add their unique national requirements.

Source: MoReq2 Preface, p. 1.

National Information Standards Organization (NISO). ANSI/NISO Z39.84-2000 Syntax for the Digital Object Identifier

This standard defines the syntax for a character string called the Digital Object Identifier (DOI). This standard is limited to defining the syntax of the DOI character string. Policies governing the assignment and use of DOIs are determined by the International DOI Foundation (IDF) and are outside the scope of this document.

Note: This standard is becoming ISO/WD 26324.

Source: DOI Web site http://www.doi.org/handbook_2000/appendix_1.html;

NISO (National Information Standards Organization)/AIIM (Association for Information and Image Management) Z39.87-2002 Technical Metadata for Digital Still Images

The purpose of this data dictionary is to define a standard set of metadata elements for digital images. Standardizing the information allows users to develop, exchange, and interpret digital image files. The dictionary has been designed to facilitate interoperability between systems, services, and software as well as to support the long-term management of and continuing access to digital image collections.

This data dictionary presents a comprehensive list of technical data elements relevant to the management of digital still images. In this context, “management” refers to the tasks and operations needed to support image quality assessment and image data processing throughout the image life cycle. “Quality assessment” is defined broadly, as it refers both to machine operations and curatorial evaluations.

Technical metadata have been identified to “anchor” meaningful attributes of image quality that can be measured objectively, such as detail, tone, color, and size.

This standard frequently refers to images maintained in TIFF (Tagged Image File Format). The TIFF format is a highly flexible and platform-independent format that is supported by numerous image processing applications. The TIFF specification is publicly available to all users. The structure of the header includes a rich set of technical information important for long-term retention such as for colorimetry, calibration, gamut tables, etc. The information is also very useful for remote sensing and multispectral applications. The repeated references to and examples citing the TIFF format within this standard can be extended to other file formats. The technical dictionary indicates the information and metadata all image files should contain as well as additional information related to image production.

Source: “Purpose and Scope” in full text, available at http://www.niso.org/standards/resources/Z39_87_trial_use.pdf

W3C XML Key Management Specification (XKMS)

This document specifies protocols for distributing and registering public keys, suitable for use in conjunction with the proposed standard for XML Signature [XML-SIG] developed by the World Wide Web Consortium (W3C) and the Internet Engineering Task Force (IETF) and an anticipated companion standard for XML encryption. The XML Key Management Specification (XKMS) comprises two parts: the XML Key Information Service Specification (X-KISS) and the XML Key Registration Service Specification (X-KRSS).

Source: W3C Web site <http://www.w3.org/TR/xkms/>

W3C Extensible Markup Language (XML) 1.0 (Fourth Edition)

The Extensible Markup Language (XML) is a subset of SGML that is completely described in this document. Its goal is to enable generic SGML to be served, received, and processed on the Web in the way that is now possible with HTML. XML has been designed for ease of implementation and for interoperability with both SGML and HTML.

Source: W3C Web site <http://www.w3.org/TR/REC-xml/>

W3C RDF/XML Syntax Specification (Revised) 2004

The Resource Description Framework (RDF) is a general-purpose language for representing information in the Web.

This document defines an XML syntax for RDF called RDF/XML in terms of Namespaces in XML, the XML Information Set and XML Base. The formal grammar for the syntax is annotated with actions generating triples of the RDF graph as defined in RDF Concepts and Abstract Syntax. It has been reviewed by W3C Members and other interested parties, and it has been endorsed by the Director as a W3C Recommendation. W3C's role in making the Recommendation is to draw attention to the specification and to promote its widespread deployment. This enhances the functionality and interoperability of the Web.

This is one document in a set of six (Primer, Concepts, Syntax, Semantics, Vocabulary, and Test Cases) intended to jointly replace the original Resource Description Framework specifications, RDF Model and Syntax (1999 Recommendation) and RDF Schema (2000 Candidate Recommendation).

3. Sources Consulted

Note: In cases where summaries or abstracts are available for the sources consulted, they are provided to help clarify the inclusion of the relevant standards in this report.

Archives and Records Association of New Zealand, "Select List of National and International Standards relating to Records & Archives."

<http://www.aranz.org.nz/Site/resources/standards.aspx>

ARMA International, "Standards/Best Practices."

<http://www.arma.org/standards/index.cfm>

Brumm, Eugenia K. (1995), "Managing records for ISO 9000 compliance," *Quality Progress* 28(1): 73–78.

All activities that affect quality, including developing a quality plan, product design, processing materials, manufacturing and distribution, must be recorded. It is the only requirement in the ISO 9000 series of standards that must be adhered to in every facet and activity. If there is a link throughout the standards, it is the emphasis on recording

information that pertains to all quality aspects. Often, the only evidence of product quality is in the records. Many decisions regarding product quality are based solely on data. In most cases, the state of the records will reflect the state of the quality system and product, because records reflect the level and depth of control and order that exist in the quality system. A records management program (RMP) forms the foundation for successful compliance with ISO 9000 records requirements. The standards' concise statements that list elements pertaining to records actually contain major components of a complete RMP, each of which can take several years to develop and implement. Grounded in orderly methods and proven approaches, records management provides a recipe for what to do, how to do it, and where to begin.

Calder, Alan, *Information Security Based on ISO 27001/ISO 17799: A Management Guide* (Van Haren Publishing, 2006).

The ISO/IEC 17799:2000 Code of Practice was intended to provide a framework for international best practice in Information Security Management and systems interoperability. It also provided guidance on how to implement an ISMS that would be capable of certification, and to which an external auditor could refer. However, it did not provide the basis for an international certification scheme. Only BS 7799-2, and now ISO 27001, can do that. ISO 17799 also provides substantial implementation guidance on how individual controls should be approached. Anyone implementing an ISO 27001 ISMS will need to acquire and study copies of both ISO 27001 and ISO 17799. ISO 27001 mandates the use of ISO 17799 as a source of guidance on controls, control selection and control implementation.

Digital Curation Center (DCC) (2006), "What are Metadata Standards?"
<http://www.dcc.ac.uk/resource/standards-watch/what-are-metadata-standards/>

Duff, Wendy and Sue McKemmish (2000), "Metadata & ISO 9000 Compliance," *Information Management Journal* 34(1): 4–12.

Advances in technology have changed organizations and altered the role of records managers. International standards such as the ISO 9000 suite highlight the essential role that records and metadata play in the operation of a quality company. Systems must be designed to create the appropriate metadata to ensure they comply with recordkeeping requirements, particularly those identified by records management standards such as AS 4390 and the proposed international standard, which provide benchmarks for recordkeeping best practice. In deciding what metadata to capture, organizations should consider the cost of meeting the requirements of the ISO 9000 guidelines and any related records management best-practice standards—along with the possible risks of not meeting these requirements.

Hofman, Hans, "The use of standards and models," in *Managing Electronic Records*, Julie McLeod and Catherine Hare, eds. (London: Facet publishing, 2005), 18–33.

International Council on Archives (ICA), “Standards.”

<http://www.ica.org/en/standards>.

International Organization for Standardization (ISO) Web site

<http://www.iso.org/iso/home.htm>

Jeffrey-Cook, Richard, “Applying ISO27001 and risk assessment to records management,” workshop presented at the Records Management Society, 11th Annual Conference “Records Management: The State of Art” 20-22 April 2008. Edinburgh, Scotland.

<http://www.rms-gb.org.uk/conference-sessions-speakers-2008>

Information and records are valuable resources within organisations that need to be protected. Many organisations focus on the protection of their electronic information assets against the risks of loss, misuse, disclosure or corruption. This process is commonly referred to as information security management. Information security management enables the sharing of information in a manner that ensures the appropriate protection of that information. Risk assessment and management, continuity planning and disaster recovery programmes should all form a part of any information security management system. The aim is to protect information from a wide range of threats in order to: Minimise the impact of a security breach; safeguard the accuracy and completeness of information; ensure that information is accessible only to those authorised to have access; ensure that authorised users have access to information as, and when, required; maximise return on investments and business opportunities. Good information security is essential for implementing successful records management. In this workshop, Richard Jeffrey-Cook looks at ISO 27001, the international standard for information security management systems. He will demonstrate how the controls that are applied for information security can be adapted to information management. ISO 27001 requires a risk management approach to be adopted to determine the priorities for planning information security improvements and deciding what level of resources should be deployed. This session demonstrates how the same approach can be used to justify an information management strategy and to help build the business case for records management improvements.

MoReq2 (draft), *Appendix 7 Standards and Other Guidelines*.

<http://www.moreq2.eu/>

Records Management Society, 11th Annual Conference “Records Management: The State of Art” 20-22 April 2008. Edinburgh, Scotland.

<http://www.rms-gb.org.uk/conference>

Snijder, Ronald (2001), “Metadata Standards and Information Analysis: A Survey of Current Metadata Standards and the Underlying Models, (Ph.D. dissertation, University of Amsterdam, 2001)

<http://www.geocities.com/ronaldsnijder/>

This dissertation is a concise survey of pre-2001 metadata standards and models.

Varendorff Consultancy, *Records Management: Information – Standards*.
<http://www.records-management.com.au/information.shtml?standards->

(Note: the following are from the InterPARES 2 bibliographical database)

Barata, K. J. (1998), “The Impact of Information Technology Standards on Recordkeeping Systems Development: Implications for Records Professionals,” *Computer Standards & Interfaces* 19(1): 51–64.

Beagrie, Neil, Hugh Buchanan, Tom Franklin, Catherine Grout, Brian Kelly, Caroline Ingram, Paul Miller, Greg Newton-Ingham and Andy Powell (2001), “Working with the DNER: Standards and Guidelines to Build a National Resource,” consultation version 1.0, Catherine Grout and Caroline Ingram, eds. (JISC, February 2001).
http://www.jisc.ac.uk/projman_standards.html

This document provides guidelines and practices critical to developing, managing, and delivering digital resources online. It will act as a source of information for projects and services involved in the development of the Information Environment for learning, teaching and research. It will also provide a point of reference and information for the variety of stakeholders interested in the development of the Information Environment and for those interested in sharing or contributing content to it.

Booth, Kietha, “Mediating for Metadata Standards: Competing Demands of E-government Archivists and Librarians for Resource Description in New Zealand,” in proceedings of the *Victorian Association for Library Automation Conference: e-volving Information Futures, 6-8 February 2002. Melbourne, Australia* (Croydon, Victoria: Victorian Association for Library Automation, 2002).
<http://www.vala.org.au/vala2002/2002pdf/05Booth.pdf>

Bricklin, Dan (2004), “Software that Lasts 200 Years,” *Dan Bricklin’s Website* (14 July 2004).
<http://www.danbricklin.com/200yearsoftware.htm>

Canadian Heritage Information Network (CHIN) (2002), “Standards.”
<http://www.chin.gc.ca/English/Standards/index.html>

Center for International Earth Science Information Network, “Metadata Standards,” *Center for International Earth Science Information Network* (2001).
<http://www.ciesin.org/metadata/TOC/standards.html>

ESRI (2003), “Spatial Data Standards and Interoperability: An ESRI White Paper.”
<http://www.esri.com/library/whitepapers/pdfs/spatial-data-standards.pdf>

Federal Geographic Data Committee (FGDC), “Content Standard for Digital Geospatial Metadata Workbook, version 2.0,” *Federal Geographic Data Committee (FGDC)* (May 2001).
http://www.fgdc.gov/metadata/documents/workbook_0501_bmk.pdf

A user-friendly workbook to aid metadata creators in implementing the CSDGM Vers. 2.0. Includes background, format requirements, element definitions, FAQs, example metadata and a glossary.

Feenstra, Bendert, *Standards for the Implementation of a Deposit System for Electronic Publications*, NEDLIB Report Series, no. 4 (The Hague: Koninklijke Bibliotheek, 2000).
<http://nedlib.kb.nl/results/NEDLIBstandards.pdf>

Gill, Tony (2002), "Re-inventing the Wheel? Standards, Interoperability and Digital Cultural Content," *D-Lib Magazine* 8(1): n.p.
<http://www.dlib.org/dlib/january02/gill/01gill.html>

Around the world, there are unprecedented funding opportunities for creating digital cultural content. However, to date there has been relatively little harmonization of the standards frameworks used in the creation, management and preservation of this content, resulting in duplication of effort, higher costs and diminished interoperability of the end results. An international group of stakeholders are hoping to address this situation by agreeing on a common set of core values and seeking to leverage existing synergies wherever possible.

Houlding, S. W. (2001), "XML – An Opportunity for 'Meaningful' Data Standards in the Geosciences." *Computers & Geosciences* 27(7): 839–849.

Extensible markup language (XML) is a recently introduced meta-language standard on the Web. It provides the rules for development of metadata (markup) standards for information transfer in specific fields. XML allows development of markup languages that describe what information is rather than how it should be presented. This allows computer applications to process the information in intelligent ways. In contrast hypertext markup language (HTML), which fuelled the initial growth of the Web, is a metadata standard concerned exclusively with presentation of information. Besides its potential for revolutionizing Web activities, XML provides an opportunity for development of meaningful data standards in specific application fields. The rapid endorsement of XML by science, industry and e-commerce has already spawned new metadata standards in such fields as mathematics, chemistry, astronomy, multimedia and Web micro-payments. Development of XML-based data standards in the geosciences would significantly reduce the effort currently wasted on manipulating and reformatting data between different computer platforms and applications and would ensure compatibility with the new generation of Web browsers. This paper explores the evolution, benefits and status of XML and related standards in the more general context of Web activities and uses this as a platform for discussion of its potential for development of data standards in the geosciences. Some of the advantages of XML are illustrated by a simple, browser-compatible demonstration of XML functionality applied to a borehole log dataset. The XML dataset and the associated stylesheet and schema declarations are available for FTP download.

IEEE Learning Technology Standards Committee (2002), “LOM Institute of Electrical and Electronics Engineers - Learning Object Mode Specifications.”

<http://ltsc.ieee.org/wg12/>

IMS Global Learning Consortium (2004), “IMS Meta-data Best Practice Guide for IEEE 1484.12.1-2002 Standard for Learning Object Metadata,” version 1.3, public draft.

http://www.imsproject.org/metadata/mdv1p3pd/imsmd_bestv1p3pd.html

Stephens, David O. (2000), “International Standards and Best Practices in RIM,” *The Information Management Journal* 34(2): 69–71.

University Archivists Group (UAG), Committee on Institutional Cooperation (2001), “Standards for an Electronic Records Policy.”

<http://www-personal.umich.edu/~deromedi/CIC/cic4.htm>

Zwaneveld, Ed H. (2003), “Preservation Reformatting???: Audio Visual Standards and Beyond,” paper presented at the 18th Annual Preservation Conference, Preservation Reformatting: Digital Technology s. Analog Technology, NARA, 27 March 2003. National Archives at College Park, Maryland, USA.

<http://www.archives.gov/preservation/conferences/papers-2003/zwaneveld.html>