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Systems and software engineering — Content management for product life-cycle, user and service management documentation

Ingénierie des systèmes et du logiciel — Gestion de contenu relatif a la documentation du cycle de vie du produit, de l'utilisateur, et de la gestion de service

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Foreword

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ISO/IEC/IEEE 26531 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information Technology*, Subcommittee SC 7, *Systems and Software Engineering* in cooperation with the Systems and Software Engineering Standards Committee of the IEEE Computer Society, under the Partner Standards Development Organization cooperation agreement between ISO and IEEE.

Introduction

This International Standard was developed to assist users of ISO/IEC/IEEE 15288:2008, *Systems and software engineering – System life cycle processes*, ISO/IEC/IEEE 12207:2008, *Systems and software engineering – Software life cycle processes*, or ISO/IEC 20000-1:2011 (IEEE Std 20000-1-2013), *Information technology – Service management – Part 1: Service management system requirements*, in the management of the content used in product life-cycle, user, and service management documentation. The accurate description of the requirements for content management helps documentation meet the needs of its users and be efficiently produced.

This International Standard is independent of the software tools that may be used to manage documentation content and applies to both printed documentation and on-screen documentation.

Content management allows an organization to control the storage and retrieval of content objects, track content revisions, maintain a content audit trail, and enable a collaborative environment. Component content management supports the reuse of content objects among deliverables and supports multiple deliverable formats.

A consequence of content management is increased collaboration on content development across the enterprise. Technical authors, instructional designers, support staff, and others may develop a body of content together that is written once and supports many needs.

Documentation is often regarded as something done after the software has been implemented. However, for high-quality software documentation, its development should be regarded as an integral part of the software life cycle. In fact, quality documentation or information management services are important enough to require specific planning.

This International Standard is consistent with ISO/IEC/IEEE 15288, *System and Software Engineering – System life cycle processes,* and ISO/IEC/IEEE 12207, *Systems and software engineering – Software life cycle processes*, as an implementation of the Information Management Process. This standard is not a management system standard.

This International Standard is intended for use in all types of organizations, whether they have a dedicated documentation department or not. It may be used as a basis for local standards and procedures. Readers are assumed to have experience or knowledge of general processes for information management, project management, and document development.

This International Standard is intended for managing technical content which is included in:

- User information such as topic collections, manuals, guides, multimedia, user assistance displayed with software, style guides, and other content that supports the effective use of a system or software product.
- Product life cycle information such as design documents, use cases, personas, project management plans, feature requests, and testing plans.
- Service management items such as service level agreements, records, policies, procedures, and other documents.

The order of clauses in this International Standard does not imply that the content management activities should be performed in this order, nor that documentation should be developed in this order or presented to the organization in this order.

In each clause, the requirements are independent of media and document creation and management specifications.

Systems and software engineering — Content management for product life-cycle, user and service management documentation

1 Scope

This standard states requirements for efficient development and management of content produced

- throughout the life-cycle of a system and software product;
- for the provision of user documentation for systems and software;
- for the management of IT services.

This standard is independent of the tools, protocols, and systems used for content management. It does not address configuration management of software assets.

The content to be managed with this standard includes

- user information such as topic collections, manuals, guides, embedded user assistance, style guides, videos and other media, and other content that supports the effective use of a system or software product;
- product life cycle information such as design documents, use cases, personas, project management plans, feature requests, models, scripts, testing plans, test scripts, defect reports;
- service management items such as service-level agreements, records, policies, procedures, and other documents.

The purpose of this standard is to define a process for content management and the requirements of a component content management system through which content is gathered, managed, and published, including the requirements of a system that is supported by an electronic database. Such a database should support documents or topics and content units that may be assembled to produce complete documents for print, electronic output, or content collections published through electronic media. This database is defined as a Component Content Management System (CCMS), which differs from a document management system. The objective of component content management is to create content objects once and use them through linking mechanisms in multiple output formats, including but not limited to documents.

The intended users of this International Standard are managers and developers of information (technical documentation) and acquirers and suppliers of content management systems. Any organization that develops content, regardless of size, can benefit from maintaining an effective content management solution and following best practices for the development and management of technical content.

Systems conforming to this standard can fulfill business needs for content development and management, especially the need for a single source of authoritative information. Content objects that are unique and are maintained as independent database objects are efficient to review, approve, and update; may be combined to produce multiple deliverables; and are cost-effective to translate.

This standard is not a management system standard.

The content management process presented in clauses 6 through 11 of this International Standard is a specialization (lower-level process) of the Information Management process required in ISO/IEC/IEEE 15288:2008 and ISO/IEC/IEEE 12207:2008.

2 Conformance

This International Standard may be used as a conformance or a guidance document for projects and organizations claiming conformance to ISO/IEC/IEEE 15288:2008, *Systems and software engineering – System life cycle processes*, or ISO/IEC/IEEE 12207:2008 *Systems and software engineering – Software life cycle processes*.

Throughout this International Standard, "shall" is used to express a provision that is binding, "should" to express a recommendation among other possibilities, and "may" to indicate a course of action permissible within the limits of this International Standard.

Use of the nomenclature of this International Standard for the parts of documentation, such as topics, content units, modules, is not required to claim conformance.

This International Standard may be included or referenced in contracts or similar agreements when the parties (called the acquirer and the supplier) agree that the supplier will deliver services and systems in accordance with the standard. This International Standard may also be adopted as an in-house standard by a project or organization that decides to acquire documentation from another part of the organization in accordance with the standard.

3 Normative references

There are no Normative References applicable to this standard.

4 Terms and definitions

For the purposes of this standard, the terms and definitions given in ISO/IEC/IEEE 24765, available at www.computer.org/sevocab and the following apply.

4.1
application programming interface
software component that allows software applications to communicate with one another

4.2
branching
method of development in which a set of components is duplicated so the components may be modified in parallel and optionally synchronized at a later time

4.3
component
an object with a discrete information type that is stored in the CCMS, such as a topic, prerequisite, section, image, or video

4.4
component content management system
content management system that supports the entire document- or information-development life cycle from authoring through review and publishing, including the reuse of modular content

NOTE In case the modular content is XML-based, the individual XML elements available for management are defined by the XML schema or DTD. This standard is protocol-independent and it is not necessary to specify numerous markup languages.

4.5
component dependencies
all the components that are linked to, directly or indirectly, from a single parent component

EXAMPLE: The relationship of a source hazard statement to its insertion in a topic at time of publication.

4.6
content object
content that is encompassed by an XML element

4.7
content type
reusable definition of settings for storage, metadata, workflow, and behaviour that is assigned to a component

4.8
content unit
identifiable and manageable part of larger information objects

NOTE The individual content units available for management are typically defined by an XML schema or DTD.

4.9
content management system
system that supports authoring, storing, translating, and publishing content

cf. document management system

4.10
customization
modification of a document type definition to add new structures or change the document type definition in a way that is not compatible with a previous structure

4.11
dependency export
operation in which a component and all of its dependencies are exported from the CCMS as a single process

4.12
document management system
system that supports the storage, retrieval, versioning, and manipulation of whole documents, images, and other media

cf. content management system

4.13
document type definition
template for the structure, content, and semantics of XML documents

4.14
documentation
any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results

[IEEE Std 829™-2008]

4.15
effectiveness
accuracy and completeness with which users achieve specified goals

[ISO/IEC 25062:2006]

4.16
EXtensible Markup Language
license-free and platform-independent markup language that carries rules for generating text formats that contain structured data

[ISO/IEC 19770-2:2009]

4.17
EXtensible Style Language Transformations
language for transforming XML documents into other document types such as PDF or HTML

4.18
faceted search
progressive search that allows users to narrow the results by selecting values for one or more attributes

4.19
[CCMS] framework
essential data structures, operations, and rules that form the foundation from which all other features of the CCMS are built

4.20
Hypertext Markup Language
language for creating web pages

4.21
Hypertext Transfer Protocol
application-level protocol for distributed, collaborative, hypermedia information systems

4.22
information item
separately identifiable body of information that is produced, stored, and delivered for human use

[ISO/IEC/IEEE 15289:2015]

NOTE An information item can be produced in several versions during a project life cycle.

4.23
information type
class of topics that addresses a particular user question

EXAMPLE An information type that answers the question “how do I …” is called a task information type.

4.24
Levenshtein distance
measure of the difference between two character sequences based on the minimum number of single character edits (insertion, deletion, or substitution) needed to convert one word to the other

4.25
link
part of a computer program, often a single instruction or address, that passes control and parameters between separate modules of the program

4.26
object
encapsulation of content units in a CCMS

4.27
publishing pipeline
series of defined processing steps that are connected to transform content from its source format into a final deliverable format

4.28
regular expression (Regex)
string of characters that allows patterns to be used to match search results

NOTE Patterns may dictate that matches must start or end with specific sequences of characters or allow the use of wildcards to match any characters in a sequence.

EXAMPLE

^admin* - Find all matches that start with 'admin' and contain any sequence of characters afterwards

\d{5}$ - Find all matches that end with the number 5

^[0-9()-]+$ - Find matches that contain a 10-digit phone number

4.29
semantic label
tag that describes the content rather than its format

EXAMPLE A semantic label such as prerequisite describes the content as a pre-requisite to the following task information. In contrast, a format label simply describes the content as a paragraph or a list.

4.30
specialization
specification of targeted document type definitions that share the common output transformations and design rules developed for more general types and domains

4.31
structured authoring
development of content elements including metadata in specified templates

NOTE In structured authoring, content elements are labeled according to the nature of the content they contain. Structured authoring also permits quasi-semantic labeling, such as Heading1 or NestedList, to indicate the hierarchical position and function of a content element.

4.32
taxonomy
scheme that partitions a body of knowledge and defines the relationships among the parts

4.33
topic
standalone item of information that answers a single user question

4.34
XML Schema definition
XML-based language that specifies a set of rules and structure for the creation of XML documents

[ISO/IEC 19770-2:2009]

5 Abbreviated terms

API Application Programming Interface

BMP Bitmap image file

CCMS Component Content Management System

DITA Darwin Information Typing Architecture

DMS Document Management System

DTD Document Type Definition

ECMS Enterprise Content Management System

GIF Graphics Interchange Format

HTML Hypertext Markup Language

HTTP Hypertext Transfer Protocol

JPEG Joint Photographic Expert Group

LCMS Learning Content Management System

QTFF QuickTime File Format (abbreviated as.mov)

MP3/MP4 See MPEG

MPEG Moving Picture Experts Group

PDF Portable Document Format

PNG Portable Networks Graphics

SCMS Source Control Content Management System

SME Subject Matter Expert

WAV Waveform Audio File Format

WMV Windows Media Video

XLIFF XML Localisation Interchange File Format

XML Extensible Markup Language

XSLT EXtensible Style Language Transformations

6 Content management process

This clause describes the activities of a process through which content is managed from initiation through approval and publishing.

Content management activities described in this standard are as follows:

- Project Initiation
  - Developing a business case for managing content
  - Defining requirements for a CCMS
- Project Plan
  - Information model
  - Authoring guidelines
  - Reuse strategy
  - Metadata schema
  - Workflow specification
  - Schedule of activities, deliverables, and responsibilities
  - Training plan
  - Stylesheet development

  - Pilot project specification
  - Organization rollout
- Information Development
  - Content conversion
  - Content authoring
- Management and control
  - Quality management
  - Review and approval
  - Search and retrieval
  - Localization and translation
  - Content deletion
  - Content archiving
- Publication
  - Release management
  - Publication of content

These can be represented as shown in Figure 1.

The details of each activity in the content management process are discussed in separate clauses.

NOTE ISO 21500, Guidance on project management, can be consulted for managing a content management project.

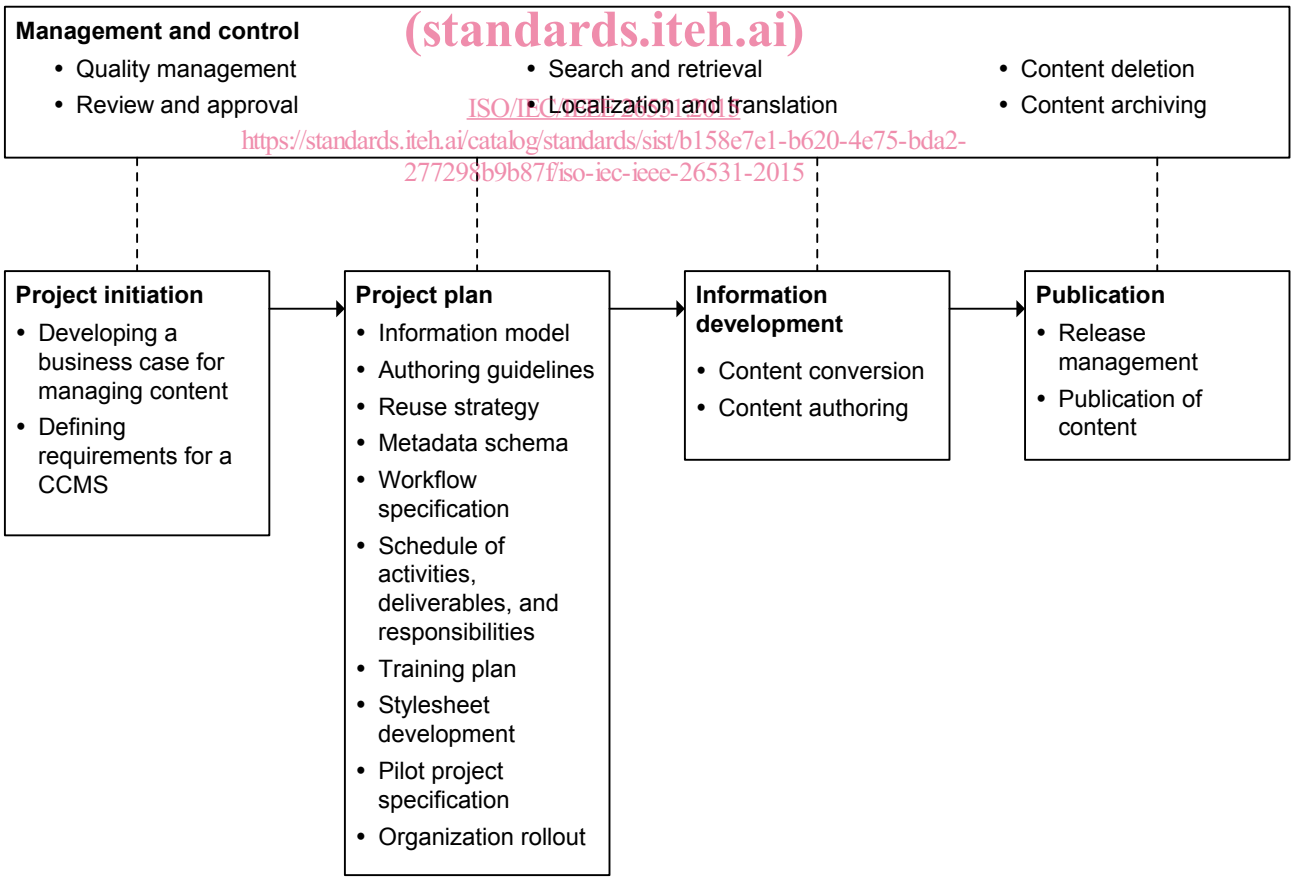

Figure 1 — Content Management process and activities