INTERNATIONAL STANDARD

ISO/ IEC/IEEE 26531

Second edition
2023-03

Systems and software engineering — Content management for product life cycle, user and service management information for users

Ingénierie des systèmes et du logiciel — Gestion de contenu relatif aux informations concernant le cycle de vie du produit, l'utilisateur et la gestion de service, à destination des utilisateurs

Reference number
ISO/IEC/IEEE 26531:2023(E)

© ISO/IEC 2023
© IEEE 2023



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2023
© IEEE 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO or IEEE at the respective address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Institute of Electrical and Electronics Engineers, Inc
3 Park Avenue, New York
NY 10016-5997, USA

Email: stds.ipr@ieee.org
Website: www.ieee.org

Published in Switzerland

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

Contents

Page

Foreword ... **vi**

Introduction ... **viii**

1 Scope ... **1**

2 Normative references ... **1**

3 Terms, definitions and abbreviated terms ... **1**
3.1 Terms and definitions ... 1
3.2 Abbreviated terms ... 5

4 Conformance ... **6**

5 Component content management system development and implementation ... **6**

6 Content management project initiation ... **7**
6.1 Developing a business case ... 7
6.2 Defining requirements for a CCMS ... 9
6.2.1 Requirements definition ... 9
6.2.2 Output requirements ... 9
6.2.3 Storage and retrieval requirements ... 9
6.2.4 Assembly and linking requirements ... 10
6.2.5 Writing, reviewing and workflow requirements ... 11

7 Project planning for CCMS implementation ... **12**
7.1 Implementation plan ... 12
7.2 Information model ... 12
7.3 Information model specification ... 13
7.4 Writing guidelines ... 14
7.5 Automation-assisted reviews ... 15
7.6 Reuse strategy ... 15
7.6.1 Content conditional processing ... 15
7.6.2 Content inclusion ... 15
7.6.3 Content variables ... 16
7.7 Metadata schema ... 16
7.7.1 General ... 16
7.7.2 Administrative metadata ... 17
7.7.3 Descriptive metadata ... 18
7.7.4 Processing metadata ... 18
7.8 Workflow ... 18
7.8.1 Workflow specification ... 18
7.8.2 Workflow approvals ... 18
7.8.3 Translation workflow ... 19
7.8.4 Workflow completion ... 20
7.9 Schedule of activities, deliverables, and responsibilities ... 20
7.10 Training plan ... 20
7.11 Style sheet development ... 20
7.12 Pilot project specification ... 20
7.13 Organizational rollout ... 21

8 Content development ... **21**
8.1 Content creation ... 21
8.1.1 General ... 21
8.1.2 Structured writing ... 21
8.1.3 Unstructured writing ... 21
8.1.4 Content granularity ... 22
8.2 Content conversion ... 22
8.2.1 General ... 22
8.2.2 Microcontent ... 23

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

9 Management and control 23
9.1 Managing quality 23
9.2 Review of content 24
9.3 Approval of content 25
9.4 Search and retrieval 25
9.5 Localization and translation 25
9.5.1 Translation management 25
9.5.2 Content management for translation 26
9.5.3 Publication of translated content 26
9.5.4 Publication of multilingual content 26
9.5.5 Translation of vector graphics 26
9.6 Content deletion 27
9.7 Content and component archiving 27

10 Publication 28
10.1 Release management 28
10.2 Version management 28
10.3 Publication of content 29

11 Component content management system requirements 30
11.1 General 30
11.2 Component content management system framework 30
11.2.1 General storage requirements 30
11.2.2 Content types 31
11.2.3 Metadata structures 31
11.2.4 Administrative metadata 31
11.2.5 Descriptive metadata 31
11.2.6 Classification 32
11.2.7 Additional metadata requirements 32
11.2.8 Organizational structures 32
11.3 Component content management system management 32
11.3.1 Component creation and modification 32
11.3.2 Import/export 33
11.3.3 Bulk export 33
11.3.4 Dependency export 33
11.3.5 Archiving 34
11.4 Content object check-out and check in 34
11.4.1 General 34
11.4.2 Bulk check-out/check-in 34
11.4.3 Check-out and check-in after restart 34
11.5 Link management 34
11.6 Search 35
11.6.1 General 35
11.6.2 Full text search 35
11.6.3 Metadata search 37
11.6.4 Structured search 37
11.6.5 Advanced search capabilities 37
11.7 Versioning 38
11.7.1 General 38
11.7.2 Branch and merge 38
11.7.3 Release management 39
11.8 Graphics and multimedia management 39
11.9 Component content management system administration 40
11.9.1 User administration 40
11.9.2 Security 40
11.10 Content creation and acquisition 41
11.10.1 Writing interface 41
11.10.2 Content and metadata functions 41
11.10.3 Scientific notation and vector graphics 42

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

11.10.4 Writing integration 42
11.10.5 Acquisition 42
11.11 Workflow 43
11.11.1 Workflow creation 43
11.11.2 Workflow specification 43
11.11.3 Workflow reporting 44
11.12 Content publication 45
11.12.1 General 45
11.12.2 Export to publishing support 45
11.12.3 Centralized publishing support 45
11.12.4 Publishing interface 45
11.12.5 XML publishing pipeline 46
11.12.6 Dynamic publishing 46
11.13 Localization and translation management 46
11.13.1 General 46
11.13.2 XLIFF support 47
11.14 Component content management system interoperability 47
11.14.1 General 47
11.14.2 Libraries and frameworks 47
11.14.3 Web services 47
11.14.4 Application Programming Interface methods 48
11.14.5 Webhooks and triggers 49

Annex A (informative) **Business case considerations for content management** **50**

Bibliography **52**

IEEE notices and abstract **54**

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board. The IEEE develops its standards through a consensus development process, approved by the American National Standards Institute, which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and serve without compensation. While the IEEE administers the process and establishes rules to promote fairness in the consensus development process, the IEEE does not independently evaluate, test, or verify the accuracy of any of the information contained in its standards.

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

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

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

ISO/IEC/IEEE 26531 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems 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.

This second edition cancels and replaces the first edition (ISO/IEC/IEEE 26531:2015), which has been technically revised.

The main changes are as follows:

— addition of information on the development of microcontent;

— addition of mathematics and vector graphics;

— addition of classification of objects using metadata and taxonomies;

— addition of webhooks and triggers;

— addition of XML reviews using Schematron or other similar systems;

— addition of reporting capabilities;

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

— addition of dynamic content generation.

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

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

Introduction

This document was developed to assist users of ISO/IEC/IEEE 15288 and ISO/IEC/IEEE 12207 in the acquisition of a content management system and the use of that content management system to manage content used in product life cycle, user, and service management information. The accurate description of the requirements for content management helps organizations create information that meets the needs of its users and is efficiently produced.

This document is independent of the software tools that may be used to manage information for users and applies to both printed information for use and on-screen information for use.

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

The use of content management functions can facilitate increased collaboration on content development across the enterprise. Technical writers, instructional designers, support staff, and others can develop a body of content together that is written once and supports many needs.

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

This document is consistent with ISO/IEC/IEEE 15288 and ISO/IEC/IEEE 12207, as an elaboration of the information management process.

This document is not a management system standard.

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

This document is intended for those engaged in the management of information, such as that included in:

a) information for users such as topic collections, manuals, guides, user assistance displayed with software, style guides, knowledge-based articles, and other content that supports the effective use of a system or software product;

b) product life cycle information such as design documents, use cases, personas, project management plans, feature requests, and testing plans;

c) service management items such as service level agreements, records, policies, procedures, documents in response to tender offers, and other documents.

The order of clauses in this document does not imply that the content management activities should be performed in this order, nor that information for users 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.

In this document, the following verbal forms are used:

— “shall” indicates a requirement;

— “should” indicates a recommendation;

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

— “may” indicates a permission;

— “can” indicates a possibility or a capability.

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

Systems and software engineering — Content management for product life cycle, user and service management information for users

1 Scope

This document specifies requirements for efficient development and management of information produced

— throughout the life cycle of a system and software product;

— for the provision of information for users of systems and software;

— for the management of IT and support services.

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

The content management process presented in Clauses 6 to 10 is a specialization (lower-level process) of the information management process specified in ISO/IEC/IEEE 15288 and ISO/IEC/IEEE 12207.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO, IEC, and IEEE maintain terminology databases for use in standardization at the following addresses:

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

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

— IEEE Standards Dictionary Online: available at https://dictionary.ieee.org/

NOTE 1 For additional terms and definitions in the field of systems and software engineering, see ISO/IEC/IEEE 24765, which is published periodically as a "snapshot" of the SEVOCAB (Systems and software Engineering Vocabulary) database and is publicly accessible at www.computer.org/sevocab.

NOTE 2 Throughout this document, the term "information for users" refers to information for users of hardware and software.

3.1.1
application programming interface
API
set of functions, protocols, parameters, and *objects* (3.1.23) of different formats, used to create software that interfaces with the features or data of an external system or service

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

3.1.2
branching
method of development in which a set of *components* (3.1.3) is duplicated so the components can be modified in parallel and optionally synchronized at a later time

3.1.3
component
object (3.1.23) with a discrete *information type* (3.1.20) that is stored in a *CCMS* (3.1.4), such as a *topic* (3.1.31), prerequisite, section, image, or video

3.1.4
component content management system
CCMS
content management system (3.1.5) that supports the entire information-development life cycle from writing through review and publishing, including the reuse of modular content

Note 1 to entry: In case the modular content is XML-based, the individual XML elements available for management are defined by the XML schema or *DTD* (3.1.12). This document is protocol-independent, and it is not necessary to specify numerous markup languages.

3.1.5
content management system
system that makes *components* (3.1.3) available for reuse and linking to build *content objects* (3.1.6) and deconstructs large content objects into components that can be individually managed

Note 1 to entry: See also *document management system* (3.1.11).

3.1.6
content object
self-contained unit of content

3.1.7
content type
specific indicator of content

3.1.8
content unit
identifiable and manageable part of larger information *objects* (3.1.23)

Note 1 to entry: The individual content units available for management are typically defined by an XML schema or *DTD* (3.1.12).

3.1.9
customization
modification of a *document type definition* (3.1.12) to add new structures or change the document type definition in a way that is not compatible with a previous structure

3.1.10
dependency export
operation in which a *component* (3.1.3) and all its dependencies are exported from the *CCMS* (3.1.4) as a single process

3.1.11
document management system
system that supports the storage, retrieval, the production of a *version* (3.1.32), and the manipulation of whole documents, images, and other media

Note 1 to entry: See also *content management system* (3.1.5).

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

3.1.12
document type definition
DTD
template for the structure, content, and semantics of documents

3.1.13
effectiveness
accuracy and completeness with which users achieve specified goals

[SOURCE: ISO/IEC 25062:2006, 4.2]

3.1.14
eXtensible Markup Language
XML
platform-independent markup language that carries rules for generating text formats that contain structured data

[SOURCE: ISO/IEC 19770-5:2015, 3.15, modified — "license-free and" has been removed from the beginning of the definition.]

3.1.15
faceted search
progressive search that allows users to narrow the results by selecting values for one or more attributes

3.1.16
framework
<CCMS>essential data structures, operations, and rules that form the foundation from which all other features of the *CCMS* (3.1.4) are built

3.1.17
Hypertext Markup Language
HTML
language for creating web pages

3.1.18
Hypertext Transfer Protocol
HTTP
application-level protocol for distributed, collaborative, hypermedia information systems

3.1.19
information item
separately identifiable body of information that is produced, stored, and delivered for human use

Note 1 to entry: An information item can be produced in several *versions* (3.1.32) during a project life cycle.

[SOURCE: ISO/IEC/IEEE 15289:2019, 3.1.12, modified — The preferred term "information product" has been removed; the original note 1 to entry has been removed; note 2 to entry becomes note 1 to entry.]

3.1.20
information type
class of *topics* (3.1.31) that addresses a particular user question

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

3.1.21
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

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

3.1.22
link
part of a computer program, often a single instruction or address, that passes control and parameters between separate *modules* (3.1.24) of the program

3.1.23
object
encapsulation of *content units* (3.1.8) in a *CCMS* (3.1.4)

3.1.24
module
appropriate independent information unit

3.1.25
publishing pipeline
series of defined processing steps that are connected to transform content from its source format into a final deliverable format

3.1.26
regular expression
Regex
string of characters that allows patterns to be used to match search results

Note 1 to entry: Patterns can dictate that matches start or end with specific sequences of characters or allow the use of wildcards to match any characters in a sequence.

EXAMPLE 1

^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

EXAMPLE 2 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.

3.1.27
Schematron
language for making assertions about the presence or absence of patterns in *XML* (3.1.14) documents

3.1.28
specialization
specification of targeted *document type definitions* (3.1.12) that share the common output transformations and design rules developed for more general types and domains

3.1.29
structured writing
development of content elements according to a pre-defined and enforced organization of content elements including metadata in specified templates

Note 1 to entry: In structured writing, content elements are labelled according to the nature of the content they contain. Structured writing also permits quasi-semantic labelling, such as Heading1 or NestedList, to indicate the hierarchical position and function of a content element.

3.1.30
taxonomy
scheme that partitions a body of knowledge and defines the relationships among the parts

3.1.31
topic
unique label or identifier, with which one or more items of information may be associated

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved

3.1.32
version
form of a text or illustration differing in certain respects from an earlier form

3.1.33
XML schema definition
XML (3.1.14) based language that specifies a set of rules and structure for the creation of XML documents

3.2 Abbreviated terms

BMP	Bitmap Image File
CSS	Cascading Style Sheets
DITA	Darwin Information Typing Architecture
FAQ	frequently asked questions
FOAF	Friend of a Friend
GIF	Graphics Interchange Format
JPEG	Joint Photographic Experts Group
JWT	JSON Web Token
QTFF	QuickTime File Format (abbreviated as.mov)
MP3/MP4	See MPEG
MPEG	Moving Picture Experts Group
PDF	Portable Document Format
PGP	Pretty Good Privacy
PNG	Portable Network Graphics
RNG	REgular LAnguage for XML Next Generation
RDF	Resource Description Framework
SKOS	Simple Knowledge Organization System
SVG	Scalable Vector Graphics
WAV	waveform audio file format
WMV	Windows Media Video
XLIFF	XML Localisation Interchange File Format
XSL-FO	XML Stylesheet Language-Formatting Objects
XSLT	XML Stylesheet Language Transformations
XHTML	eXtensible HyperText Markup Language

© ISO/IEC 2023 – All rights reserved
© IEEE 2023 – All rights reserved