



BSI Standards Publication

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

National foreword

This British Standard is the UK implementation of [ISO/IEC/IEEE 26531:2023](#). It supersedes [BS ISO/IEC/IEEE 26531:2015](#), which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee IST/15, Software and systems engineering.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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© The British Standards Institution 2023
Published by BSI Standards Limited 2023

ISBN 978 0 539 16501 2

ICS 35.080

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2023.

Amendments/corrigenda issued since publication

Date	Text affected
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INTERNATIONAL STANDARD

ISO
26531

Second edition
2023-03-30

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 26531:2023(E)
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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).

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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;

— 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.

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;
- “may” indicates a permission;

— “can” indicates a possibility or a capability.

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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

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).

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

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

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

4 Conformance

The purpose of this document is to define a process for the development and acquisition of a component content management system and the requirements of a component content management system through which content is created, 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 can be assembled to produce complete documents for print, electronic output, or content 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 document are managers and developers of technical information 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 information.

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

This document may be used as a conformance or a guidance document for projects and organizations claiming conformance to [ISO/IEC/IEEE 15288](#) or [ISO/IEC/IEEE 12207](#).

Use of the nomenclature of this document for the parts of information for users, such as topics, content units, modules, is not required to claim conformance.

This document 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 this document. This document may also be adopted as an in-house standard by a project or organization that decides to acquire information for users from another part of the organization in accordance with this document.

5 Component content management system development and implementation

Component 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.

The implementation of a component content management may result in increased collaboration on content development across the enterprise. Technical writers, instructional designers, support staff, and others may develop a body of content together that is created once and supports multiple needs.

Component content management system development and implementation processes described in this document are illustrated in [Figure 1](#). The details of each activity in the content management development and implementation process are discussed in separate clauses.

NOTE [ISO 21500](#) and [ISO/IEC/IEEE 26511](#) can be consulted for managing a content management project.

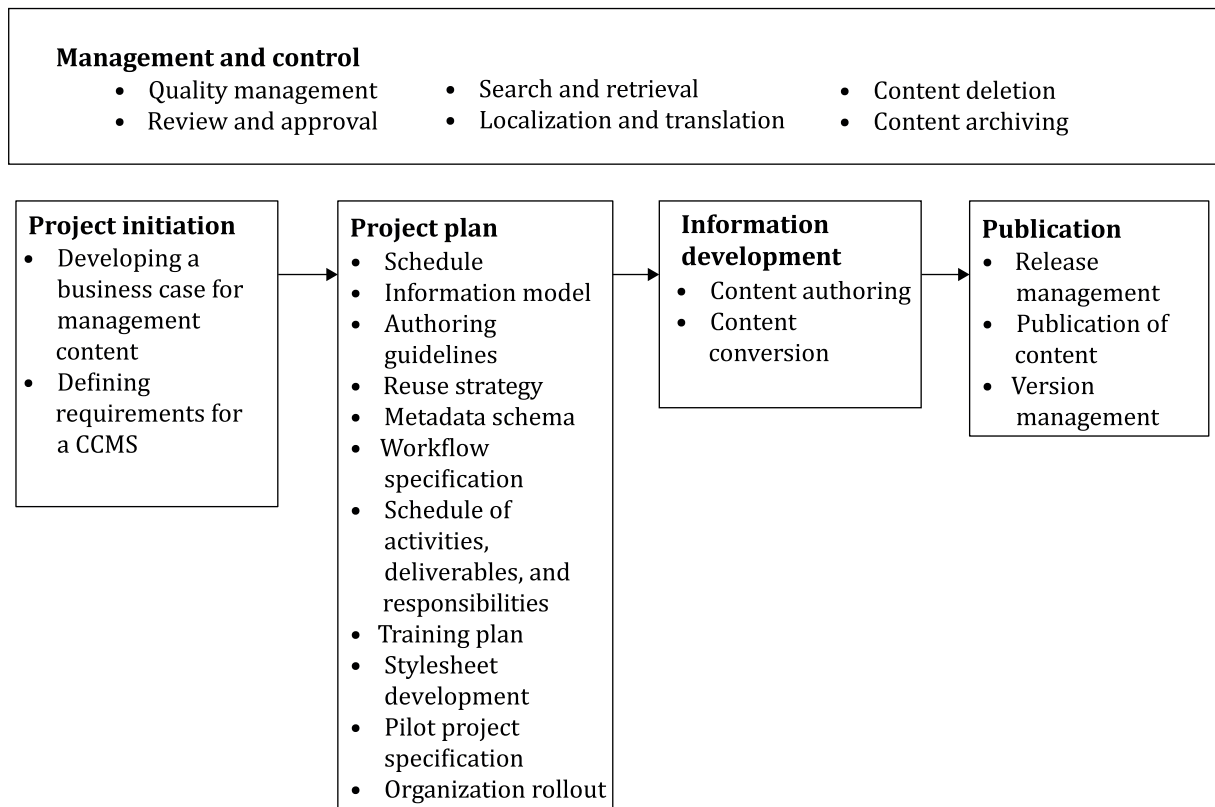


Figure 1 — Component content management development and management processes and activities

6 Content management project initiation

6.1 Developing a business case

The organization shall develop a business case to support the acquisition, development, and implementation of a component content management solution.

In developing a business case for component content management, an organization shall evaluate the needs of the organization, as follows:

- a) Analyse the current state.
- b) Identify potential customer benefits.
- c) Identify potential author benefits.
- d) Identify potential organizational benefits.
- e) Identify cost reduction opportunities.
- f) Calculate acquisition and implementation costs, including both technology and personnel costs, including the cost of training for the working group.
- g) Calculate the return on investment.
- h) State the risks of the project.

The development of a business case can be necessary to obtain support and funding for a component content management solution. Establishing the business benefits of component content management

in an organization includes carefully evaluating both immediate and long-term gains and evaluating enterprise and departmental solutions. Understanding the present situation assists in developing a vision of why and how that situation should be changed.

Component 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 component content management is increased collaboration on content development across the enterprise. Technical authors, instructional designers, support staff, and others should develop a body of content together that is created once and supports multiple needs.

By implementing a CCMS and activities to support that system, organizations can experience the following benefits:

- Standardized methods for creating content
- Standardized levels of content quality
- Avoidance of duplicated or near-duplicated content
- Reduced maintenance of content objects
- Improved access and successful search to content objects with appropriate permissions
- Reduced storage and maintenance requirements through consolidation of content in a unified system
- Traceability of review and approval cycles and change management
- Reduced development costs in source and target languages
- Improved relationship linking between source and target languages
- Ability to mitigate legal and compliance risk through a single source of authoritative content
- Ability to deliver content in multiple formats according to current and future standards

For more detailed information about developing a business case, see [Annex A](#).

Component content management, if well controlled and managed, increases staff productivity and reduces development and publishing costs. Productivity increases are achieved by implementing processes that support structured writing and content reuse. Structured writing implies that content is written according to specified templates, depending upon the type of content to be developed. Content reuse implies that content objects are stored and maintained uniquely, decreasing the cost of updating and translating the same content multiple times.

Content reuse also implies that a content object is a single source of authoritative content, ensuring that the same information and the exact message appears in every instance of output, decreasing the liability associated with incorrect information. Development costs are reduced because existing content is available to authors through search and retrieval, implying that specific information is created and updated only once. Publishing costs are reduced because content objects may be published in more than one format using automated publishing routines.

If content is developed using an XML schema definition (XSD) or comparable standard grammar, the cost of formatting that content in multiple languages is eliminated once appropriate style sheets are in place. For those organizations that are required by customer requirements to publish content in multiple languages, CCMSs and processes enable significantly decreased time and cost. CCMSs that enable rigorous linking between content objects also support links between source and target language content objects. Once a body of content has been translated, CCMSs establish links between source and target language content objects so that only new or revised content need be translated. Previously

translated content doesn't need to be sent again for translation, reducing not only translation costs but also administrative costs in handling already translated content.

6.2 Defining requirements for a CCMS

6.2.1 Requirements definition

The business case identifies concerns to be addressed in the explicit definition of requirements for a CCMS. The development of a detailed requirements definition enables an organization not only to specify its requirements internally but also to carefully evaluate competing products. A well-structured requirements definition focuses on five key areas:

- a) Output ([6.2.2](#))
- b) Storage and retrieval ([6.2.3](#))
- c) Assembly and linking ([6.2.4](#))
- d) Writing, reviewing, and workflow ([6.2.5](#))
- e) Information technology and architecture requirements

6.2.2 Output requirements

Output requirements shall specify the content delivery mechanisms that make information available to the user community, both internally and externally.

Translation requirements, including the languages and character sets (fonts) required, shall be specified.

Requirements for automatically creating translation packages for transmittal to localization service providers should be specified, typically including the use of the XLIFF standard for the transmission of unified data files for translation.

NOTE The OASIS XLIFF provides such a specification at https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=xliff. Also see [ISO 21720](#).

By profiling output, an organization can target different versions of information to different groups, based on internal needs, market segments, specific customers, and others.

Information can potentially encompass multiple versions of a collection of products, where much of the information is shared and some of the information is varied depending on product type, mode, product release, or version.

Information can be output in multiple media, including print, PDF, embedded user assistance, electronic devices, electronic applications (apps), e-learning, web pages, information portals, and others. Information can vary depending on the location or language of the users.

Output requirements should include the potential use of topic- and publication-specific metadata to enable faceted search mechanisms. Metadata should also include output specification such as the content of text referring to legal requirements, headers and footers, title pages, and covers.

6.2.3 Storage and retrieval requirements

In preparing storage and retrieval requirements, organizations shall identify how each division or component of the organization using the CCMS will access its content. Storage requirements shall include the ability to maintain links between content objects.

Requirements shall be stated for the storage and retrieval of translated content, especially the requirement to maintain synchronicity between source and target languages to reduce translation costs.