

DRAFT INTERNATIONAL STANDARD

ISO/IEC/IEEE DIS 23026

ISO/IEC JTC 1/SC 7

Secretariat: **BIS**

Voting begins on:
2022-09-01

Voting terminates on:
2022-11-24

Systems and software engineering — Engineering and management of websites for systems, software, and services information

Ingénierie des systèmes et du logiciel — Ingénierie et gestion de sites web pour les systèmes, logiciels et services d'information

ICS: 35.080

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC/IEEE FDIS 23026](https://standards.iteh.ai/catalog/standards/sist/b24ed822-0413-439a-8b03-2c4c9d32c20a/iso-iec-ieee-fdis-23026)

<https://standards.iteh.ai/catalog/standards/sist/b24ed822-0413-439a-8b03-2c4c9d32c20a/iso-iec-ieee-fdis-23026>

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

This document is circulated as received from the committee secretariat.



Reference number
ISO/IEC/IEEE DIS 23026:2022(E)

© ISO/IEC 2022
© IEEE 2022

iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO/IEC/IEEE FDIS 23026

<https://standards.iteh.ai/catalog/standards/sist/b24ed822-0413-439a-8b03-2c4c9d32c20a/iso-iec-ieee-fdis-23026>



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2022
© IEEE 2022

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

Contents

Page

Foreword	vi
Introduction	vii
1 Scope	1
1.1 General.....	1
1.2 Word usage.....	1
2 Normative references	2
3 Terms and definitions	2
3.1 Defined terms.....	2
3.2 Abbreviated terms.....	5
4 Planning websites	7
4.1 Defining the purpose, users, and context of the website.....	7
4.2 Establishing the informational website design and sustainment strategies.....	7
4.2.1 General.....	7
4.2.2 Website plan.....	8
4.2.3 Website maintenance planning.....	9
4.2.4 Website maintenance procedures.....	9
4.3 Establishing the privacy and security strategy.....	9
5 Designing and engineering websites	11
5.1 Design goals and website requirements.....	11
5.2 Design principles.....	12
5.3 Choice of devices and media.....	13
5.4 Engineering for website security.....	13
5.4.1 Website operational security procedures.....	14
5.4.2 Website security reviews and audits.....	15
5.5 Engineering for performance, scalability, and sustainability.....	16
5.5.1 General.....	16
5.5.2 Selecting technical formats and standards to use for the website.....	16
5.5.3 Bandwidth efficiencies.....	18
5.5.4 Document type declaration.....	19
5.5.5 Description meta-tag.....	19
5.5.6 XML considerations.....	19
5.5.7 Image formats, image compression and video.....	19
5.5.8 Server technology independence.....	20
5.5.9 Designing for performance and scale.....	20
6 Testing and evaluating websites	21
6.1 Test planning.....	21
6.2 Testing for usability.....	22
6.2.1 Validation of markup language and accessibility conformance.....	22
6.2.2 Operational validation.....	22
6.2.3 Active links.....	23
6.2.4 Dead links.....	23
6.3 Testing for performance and resilience.....	24
6.4 Testing for security.....	24
7 Managing the website	24
7.1 Website roles and responsibilities.....	24
7.2 Control of information content.....	25
7.3 Managing security.....	26
8 Sustaining the website	26
8.1 General.....	26
8.2 Continuous delivery, content validation, and versioning.....	26
8.3 Handling disconnects.....	27

8.3.1	General	27
8.3.2	Site or page relocation	27
8.3.3	Redirection	28
8.4	Security monitoring and measurement	28
8.5	Backups and archiving	29
8.5.1	Backups	29
8.5.2	Archiving	30
9	Website features	30
9.1	Web page components	30
9.1.1	General	30
9.1.2	Website home page	31
9.1.3	Identifying the website and its owner	32
9.1.4	Page title, header, and headings	32
9.2	Site navigation	33
9.2.1	General	33
9.2.2	Links	34
9.2.3	Offsite warning	35
9.2.4	Usage tracking and cookies	35
9.2.5	Frames	35
9.3	Search and indexing	36
9.3.1	General	36
9.3.2	Search filtering	36
9.3.3	Keywords	37
9.3.4	Metadata for indexing	37
9.3.5	Flushing search engines	37
9.4	Presentation of information	37
9.4.1	Presentation of text	37
9.4.2	Graphic images	38
9.4.3	Animations, 3D, sound, video	39
9.4.4	Use of colour in websites	39
9.4.5	Time-sensitive content	39
9.4.6	Printing from websites	41
9.5	Accessibility	42
9.6	Website security	44
9.6.1	Overall security considerations	44
9.6.2	Website security monitoring and measurement	44
9.6.3	Web page security designations	45
9.6.4	Security of the website code	46
9.6.5	Website access and authentication	47
9.7	Data management	49
9.7.1	General	49
9.7.2	Website information integrity	50
9.7.3	Data encryption	50
9.7.4	Data privacy	50
9.7.5	Intellectual property rights	52
9.8	User interaction	52
9.8.1	Providing user support	52
9.8.2	Collaboration and user generated content	53
9.9	Translation and localization	53
9.9.1	General	53
9.9.2	Browser language selection	53
9.9.3	Icon use	54
9.9.4	Holidays and time zones	54
9.9.5	Place of origin	54
9.9.6	Hemisphericals	55
9.9.7	Metric and monetary units	55
9.9.8	Regulations	55
9.9.9	Contact Information	55

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC/IEEE FDIS 23026](https://standards.iteh.ai/catalog/standards/sist/b24ed822-0413-439a-8b03-2c4c9d32c20a/iso-iec-ieee-fdis-23026)

<https://standards.iteh.ai/catalog/standards/sist/b24ed822-0413-439a-8b03-2c4c9d32c20a/iso-iec-ieee-fdis-23026>

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives). IEEE Standards documents are developed within the IEEE Societies and the Standards Committees of the IEEE Standards Association (IEEE-SA) Standards Board.

IEEE Standards documents are developed within the IEEE Societies and 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, IEC, and IEEE 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).

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.

This document was prepared by Technical Committee ISO/IEC JTC 1, Information technology, Subcommittee 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 of ISO/IEC/IEEE 23026 cancels and replaces ISO/IEC 23026:2015, which has been technically revised. ISO/IEC/IEEE 23026 originated in the adoption of IEEE Std 2001-2002 (TM) IEEE Recommended Practice for the Internet — Website Engineering, Website Management, and Website Life Cycle. The IEEE contributed IEEE Std 2001-2002 as a source for ISO/IEC/IEEE 23026.

The main changes compared to the previous edition are as follows:

- Updates relating to enhanced technical capabilities for website design and sustainment
- Attention to threats to data privacy and website integrity
- Reorganization to present both the life cycle processes of website information for informational websites, and the requirements for website features.

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.

Introduction

Continuing improvements in Internet capabilities for technical communication, and the accelerating development of new technical protocols, products, and services for website development and hosting, have both simplified and complicated the engineering and management of websites. This document is intended to account for new capabilities, approaches, and interests in using websites to communicate technical information. To a large extent, use of digital communications, particularly those accessible through the Internet or intranets, has supplanted printed publications for conveying technical information. This trend applies to information for users, systems and services documentation, and operational plans, policies, and procedures.

Other factors have also affected the design and operation of websites. The increasing sophistication of information security threats to technical enterprises and their information, as well as concerns for the privacy of Internet users, have markedly complicated the process of delivering ICT information over the Web. This revision of ISO/IEC/IEEE 23026 therefore has increased emphasis on information security and privacy concerns.

The diversity of websites for commercial marketing and social networking purposes reflects different interests and media choices from those websites that deliver ICT reference information. This revision of ISO/IEC 23026 applies primarily to websites whose purpose is to deliver information about information and communications technology (ICT) systems, software, and services. It includes increased emphasis on the human factors concerns for making information easily retrievable and usable for the intended audience. It recommends practices for websites based on World Wide Web Consortium (W3C®) and related industry guidelines, which have changed since the original version of this standard. It continues to address the entire life cycle of website strategy, design, engineering, testing and validation, and management and sustainment, which are the responsibility of the website owner and website provider.

(standards.iteh.ai)

[ISO/IEC/IEEE FDIS 23026](https://standards.iteh.ai/catalog/standards/sist/b24ed822-0413-439a-8b03-2c4c9d32c20a/iso-iec-ieee-fdis-23026)

<https://standards.iteh.ai/catalog/standards/sist/b24ed822-0413-439a-8b03-2c4c9d32c20a/iso-iec-ieee-fdis-23026>

Systems and software engineering — Engineering and management of websites for systems, software, and services information

1 Scope

1.1 General

This document defines system engineering and management requirements for the life cycle of websites, including strategy, design, engineering, testing and validation, and management and sustainment for Intranet and Extranet environments. This document applies to those using web technology to present information and communications technology (ICT) information, such as information for users of systems and services, plans and reports for systems and software engineering projects, and documentation of policies, plans, and procedures for IT service management. This document provides requirements for website owners and website providers, managers responsible for establishing guidelines for website development and operations, website engineers, designers, developers, and operations and maintenance staff, who may be external or internal to the website owner's organization. It applies to websites for public access and for limited access, such as for users, customers, and subscribers seeking information on IT systems, products and services.

The goal of this document is to improve the usability of informational websites and ease of maintenance of managed Web operations in terms of:

- a) locating relevant and timely information,
- b) applying information security management,
- c) facilitating accessibility and ease of use,
- d) providing for consistent and efficient development and maintenance practices.

This document is not aimed at websites used primarily for marketing or sales, or to deliver instructional material (tutorials), or to provide Graphical User Interfaces (GUI) for business or consumer transactional application processing. However, this document can provide useful insights for managing such sites.

This document is independent of vendor and product considerations. It does not include specifications for application development tools, programming and scripting languages used for websites, metadata tags, or protocols for network communications. It does not address tools or systems used for management or storage of information content (data, documents) that may be presented on websites.

This document does not address the design and architecture of software and systems supporting the Internet.

1.2 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (*shall* equals *is required to*).^{1) 2)}

1) The word *must* is deprecated and cannot be used when stating mandatory requirements; *must* is used only to describe unavoidable situations.

2) The word *will* is deprecated and cannot be used when stating mandatory requirements; *will* is only used in statements of fact.

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (*should* equals *is recommended that*).

The word *may* is used to indicate a course of action permissible within the limits of the standard (*may* equals *is permitted to*).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (*can* equals *is able to*).

2 Normative references

There are no normative references for this document.

3 Terms and definitions

3.1 Defined terms

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <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.

Use of the terminology in this document is for ease of reference and is not mandatory for conformance with this document.

3.1.1

archival page

content that is preserved as a record and not expected to change

Note 1 to entry: Due to technology upgrades, some archival pages cannot be readily rendered unless they are upgraded along with active pages.

3.1.2

audience

category of users sharing the same or similar characteristics and needs (for example, purpose in using the information for users, tasks, education level, abilities, training, and experience) that determine the content, structure, and use of the intended information

Note 1 to entry: There can be different audiences for information for users (for example, management, data entry, maintenance, engineering, business professionals).

3.1.3

body metadata

elements in the body of an HTML document providing administrative or navigational facilities for the user or administrator

3.1.4

breadcrumb trail

navigational aid with a displayed series of hyperlinks which lead from the *home page* (3.1.13) or another page to the current page

3.1.5**browser**

application allowing a person to retrieve and read hypertext, to view the contents of hypertext nodes (*web page* (3.1.27)), to navigate from one web page to another, and to interact with the *content* (3.1.6), such as changing the visual appearance of the displayed content

3.1.6**content (object)**

interactive or non-interactive object containing information represented by text, image, video, sound, or other media

3.1.7**cookie**

small file created by the user's web browser that is stored in and retrieved from the user's device to maintain state information, including identification of users and transaction coherency

3.1.8**extranet**

intranet that is accessible to authorized external users for the retrieval or exchange of information

3.1.9**faceted search**

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

3.1.10**feature**

functional or non-functional distinguishing characteristic of a system, usually an enhancement to an existing system

3.1.11**frame**

element that divides a *browser* (3.1.5) window into independent windows for displaying different *content* (3.1.6), or different parts of the same content (document)

3.1.12**global navigation**

set of *navigation* (3.1.19) links available on all pages of a *website* (3.1.28)

3.1.13**home page**

page of a *website* (3.1.28) through which users typically enter the website, and whose *URL* (3.1.24) is typically published or linked as the main web address of the site or organization

Note 1 to entry: Synonym: center page, front page, index page, main page, start page, top page.

3.1.14**Internet**

worldwide interlinked computer systems and networks connected by gateways that enable the transfer of data between them

3.1.15**intranet**

managed network (3.1.16) operating within an organization with controlled and limited access

3.1.16**link**

reference from some part of one document to some part of another document or another part of the same document

Note 1 to entry: Synonym: hyperlink

3.1.17

managed network

network or set of networks established and controlled by one or more organizations to meet specific organizational or business needs

3.1.18

managed website

website ([3.1.28](#)) created and maintained based on organizational guidelines

3.1.19

navigation

process of accessing on-screen information by moving between different locations in a *website* ([3.1.28](#)) or electronic document

3.1.20

orphan page

page on a *website* ([3.1.28](#)) with no *link* ([3.1.15](#)) from any other page on the website

3.1.21

persistent

for a *URL* ([3.1.24](#)), describing a reference that does not need to change at the *link* ([3.1.15](#)) in a document, and can still reach the desired object even though that object may have changed locations

3.1.22

responsive web design

RWD

method for *web page* ([3.1.27](#)) construction to detect the user's screen size and orientation and dynamically change the layout accordingly

3.1.23

site map

textual or graphical overview of the navigation structure of a *website* ([3.1.28](#))

3.1.24

thumbnail

miniature image file displayed for quick identification of a larger image or video file

3.1.25

Uniform Resource Locator

URL

mechanism for identifying resources on the *Internet* ([3.1.13](#)) (such as a *web page* ([3.1.28](#))) by specifying the address of the resource and the access protocol used

Note 1 to entry: The term as specified by the IETF is uniform resource identifier (URI) of which URL is a subset.

3.1.26

user profile

set of attributes that are unique to a specific user or user group, such as job function or subscription to a service, used to control the parts of the system or *web page* ([3.1.28](#)) that users can access

3.1.27

web lead

person or group responsible to the *website owner* ([3.1.29](#)) for ongoing maintenance of the site's presentation and availability

3.1.28**web page**

coherent presentation of a set of *content* (3.1.6), objects and associated interaction objects delivered to users through a *browser* (3.1.5) in accordance with *Internet* (3.1.13) protocols

Note 1 to entry: A Web page can be generated dynamically from the server side, and can incorporate multimedia, applets or other elements active on either the client or server side.

3.1.29**website**

collection of logically connected *web pages* (3.1.27) managed as a single entity

Note 1 to entry: A website may contain one or more subordinate websites.

3.1.30**website owner**

organization responsible for the site *content* (3.1.6) and site design

Note 1 to entry: The website owner may select a supplier as the website provider or may also be the website provider.

3.1.31**website provider**

organization responsible for operation of the website and delivery of site *content* (3.1.6) to users

Note 1 to entry: The website provider may also be the site owner, web lead, site designer, or the Internet or cloud service provider for the site.

3.1.32**wiki**

website that allows a group of users to add and edit content collaboratively

3.2 Abbreviated terms

3D	three-dimensional
API	application programming interface
CI	configuration item
CSS	cascading style sheets
CVE	common vulnerabilities and exposures
CVSS	Common Vulnerability Scoring System
DNS	Domain Name Service
DOI	Digital Object Identifier™
DTD	Document Type Definition (for XML or SGML specifications)
FTP	File Transfer Protocol
GDPR	General Data Protection Regulation
GIF	Graphics Interchange Format
GUI	graphical user interface
HIPAA	Health Insurance Portability and Accountability Act

ISO/IEC/IEEE DIS 23026:2022(E)

HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
HTTPS	HyperText Transfer Protocol Secure
ICT	information and communications technology
IETF	Internet Engineering Task Force
IP	Internet Protocol
IPR	intellectual property rights
JPEG	Joint Photographic Experts Group (image format)
JPG	Joint Photographic Group
JSON	Java Script Object Notation
MAC	Media Access Control
OTP	one-time password
PHP	hypertext preprocessor
PII	personally identifiable information
PIN	personal identification number
PNG	Portable Network Graphics
RDF	Resource Description Framework
SGML	Standard Generalized Markup Language
SSL	Secure Sockets Layer
TCP	Transport Control Protocol
TLS	Transport Layer Security
URI	Uniform Resource Identifier
UTC	Coordinated Universal Time
WAI	Web Accessibility Initiative (W3C)
WAP	Wireless Application Protocol
WCAG	Web Content Accessibility Guidelines
W3C	World Wide Web Consortium
XHTML	Extended HyperText Markup Language
XML	Extensible Markup Language

4 Planning websites

4.1 Defining the purpose, users, and context of the website

This document addresses websites that have the general purpose of providing information about ICT systems, software, or service management. Within this scope, a broad range of purposes, audience (users), and resulting types of content can be included, such as policies, plans, specifications, operating procedures and instructions (user manuals), service descriptions, service agreements, knowledge management articles, help desk scripts, test plans, technical reports, and descriptions of concepts.

When planning for the website, the website owner shall document the purpose and intended users of the website. This information may be placed in a plan, charter, or policy and represented by use cases or scenarios. It influences the decisions on what information content belongs on the website and how to organize and present the content. This governing document or another explicit statement of purpose, suitable for use by possible stakeholders, should be posted as part of the website.

A website may address one or more diverse sets of users. The users of the website can include internal management and technical staff, external customers, or the public. Thus, the website content can include general user information or procedures and specialized technical information for trained technical users. Websites may be intended for a specific group, such as internal helpdesk or external customers. Some websites may allow users to add content as part of a collaborative community or post comments in a wiki. Some sites include both technical information for existing customers and marketing presentations for prospective customers. The owner of the technical information can host some sites; other sites can run on services offered by unrelated website providers, who may have their marketing information and third-party advertisements displayed alongside the website owners' technical content. Sites can be intended for local or global use and offered in one or multiple languages.

Websites are often developed to serve several purposes and users of different technical backgrounds. Therefore, the site should be designed to allow users to understand the content's scope and functionality. The introductory pages of the site should include a description of the purpose and intended uses of the website, with links to topics accessible within one link or search which satisfies the information needs of casual users. Global navigation features and search functions should allow more technical users to access needed information quickly (see [9.2](#)).

The effective communication of the content to the user is the primary purpose of an informational website. Ease of access to information by targeted-user communities is an example of one of the possible design goals.

The website designers should consider responsive website design to accommodate different devices. Websites may consist of static pages, system-generated pages, and dynamic pages, including user-generated content. Furthermore, any of these options may be combined to provide the intended information to the website's users. The target user community can have a wide diversity of connection speeds, display devices, or selected presentation formats within the display windows; this may establish some presentation constraints (consider displaying Web pages to small screens on mobile devices).

The size and resolution of the screen should be considered in the design and usability of the website. For example, most smart phones and tablets use pop-up screen keyboards which can be too small to use without a stylus.

Website planning shall identify the target web browsers. In some cases, the website should target all major browsers. In other cases, it may be acceptable to target a small subset of browsers or a specific browser. The users should receive a clear notification if the site is not compatible with their browser.

4.2 Establishing the informational website design and sustainment strategies

4.2.1 General

Organizational effectiveness, competitive success, and even meeting legal obligations and avoiding liabilities can depend on timely access to critical information within an organization. Website design