
**Information technology — User interface
icons —**

**Part 10:
Framework and general guidance**

*Technologies de l'information — Icônes d'interface utilisateur —
Partie 10: Cadre et conduite générale*

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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.

ISO/IEC 11581-10 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 35, *User interfaces*.

ISO/IEC 11581 consists of the following parts, under the general title *Information technology — User interface icons*:

— *Part 1: Introduction to and overview of icon standards*

— *Part 2: Object icons*

— *Part 3: Pointer icons*

— *Part 5: Tool icons*

— *Part 6: Action icons*

— *Part 10: Framework and general guidance*

— *Part 40: Management of icon registration*

The following part is under preparation:

— *Part 41: Data structure to be used by the ISO/IEC JTC1/SC35 icon database*

Introduction

Icons are used on Information and Communications Technology (ICT) products to facilitate interaction with their users. Icons can provide a language-independent means of communicating information to the user.

This part of ISO/IEC 11581 recognizes that icons are more than just symbols used on computer screens. Icons are interaction objects used by computer interfaces to accomplish various purposes. Icons can be rendered in various forms, including using graphics, gesture, audio, tactile/haptics, or any combination thereof. This versatility in rendition can provide greater accessibility to their underlying functionalities.

This part of ISO/IEC 11581 provides a framework as a basis for organizing information related to the creation and use of user interface icons.

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Information technology — User interface icons —

Part 10: Framework and general guidance

1 Scope

This part of ISO/IEC 11581 provides guidance for developers and designers creating and/or using icons and provides a basis for the standardization of icons. It also provides a framework for creating future parts of ISO/IEC 11581 and for identifying icon-related information to be used in any accompanying icon registries.

It is important that icons are viewed not only as individual renditions with their associated functionality, but also that the context in which they are used is considered. This part of ISO/IEC 11581 gives requirements and recommendations for icons as they relate to other rendered elements, to sets of icons and to consistency among these symbols.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 11581-3 *Information technology — User system interfaces and symbols — Icon symbols and functions — Part 3: Pointer icons*

3 Terms and definitions

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

3.1

activation

initiation of the icon function of a selected icon

EXAMPLE When a mouse is used, the activation function is performed by double clicking on a mouse button.

NOTE Adapted from ISO/IEC TR 11580:2007, definition 2.12.

3.2

function description

language-dependent set of words used to clarify the object and/or function represented by the icon to the user

NOTE 1 The function description is used to elaborate on the meaning presented by the icon label.

NOTE 2 Adapted from the definition of “description” (2.9) in ISO/IEC TR 11580:2007.

3.3
discriminability
ease with which a given icon can be distinguished from other icons that might occur in close spatial, temporal, or contextual proximity

NOTE Discriminability applies both to non-textual representations and to icon labels.

3.4
icon
user-interface symbol representing an object and/or function of the computer system

NOTE 1 Within this part of ISO/IEC 11581, “icon” is also used to refer to the function or object represented by the user-interface symbol. An icon, which is generally rendered using an identifiable user-interface symbol, is much more than just a user-interface symbol; it also includes functionality (either as the object it represents or as the function that it represents).

NOTE 2 The concept of a symbol is used in the most generic of senses and can be rendered in various modalities. Renderings of these user-interface symbols include visual (graphical) icons, auditory icons, and tactile icons.

3.5
attribute
<icon> data item that modifies or describes some aspect of an icon

NOTE Adapted from ISO/IEC TR 11580:2007, definition 2.2.

3.6
function
<icon> capability of the computer system represented by an icon

3.7
graphic
<icon> visual representation of an icon

3.8
internal identifier
<icon> language-independent information used to internally define an icon that is intended to ensure system-based recognition of a particular icon

NOTE 1 Adapted from ISO/IEC TR 11580:2007, definition 2.6.

NOTE 2 The identifier of an icon is called “internal” because it is only intended for the use of the system and is not intended to be presented to the user.

3.9
label
<icon> language-dependent information used to supplement or provide a textual representation of the icon

NOTE 1 An icon label can be rendered with other renderings of an icon or on its own.

NOTE 2 This can include information in various languages, e.g. English, Japanese, Blissymbols.

NOTE 3 Adapted from ISO/IEC TR 11580:2007, definition 2.8.

3.10
operation
<icon> predefined interaction with an icon that a user initiates

NOTE 1 The main icon operations are selection, activation, and manipulation.

NOTE 2 Adapted from ISO/IEC TR 11580:2007, definition 2.4.

3.11**manipulation**

controlling the selected icon without activating it

3.12**selection**

explicitly identifying an icon that is intended as the target for subsequent action

EXAMPLE When a mouse is used, the selecting function is performed by clicking once on a mouse button.

NOTE Adapted from ISO/IEC TR 11580:2007, definition 2.10.

3.13**selection indication**

cue that indicates the selected icon, to which the user may apply a subsequent action

NOTE Adapted from ISO/IEC TR 11580:2007, definition 2.11.

3.14**state**

status of an icon which is related to the currently permitted interactions with the icon

EXAMPLES "active", "available", "selected", "unavailable".

NOTE Adapted from ISO/IEC TR 11580:2007, definition 2.7.

3.15**state variations**

permitted alterations of an icon's non-textual representation used to present state information

3.16**style variations**

permitted alterations of an icon graphic used to adapt all non-textual representations to specific design styles or specific system technologies while retaining their essential perceptual characteristics including discriminability

3.17**translation**

alternate version of language-dependent components of an icon to suit specific cultural and linguistic audiences while retaining their essential content and discriminability

3.18**user-interface element**

entity of the user interface that is presented to the user by the software

EXAMPLES Text, graphic, control.

NOTE 1 User-interface elements can be interactive or not.

NOTE 2 Both entities relevant to the task and entities of the user interface are regarded as user-interface elements. A user-interface element can be a visual representation or an interaction mechanism for a task object (such as a letter, sales order, electronic part or wiring diagram) or a system object (such as a printer, hard disk or network connection). It can be possible for the user to directly manipulate some of these user-interface elements.

NOTE 3 User-interface elements in a graphical user interface include basic objects (such as window title bars, menu items, push buttons, image maps, and editable text fields) and containers (such as windows, grouping boxes, menu bars, menus, groups of mutually-exclusive option buttons, and compound images that are made up of several smaller images). User-interface elements in an audio user interface include menus, menu items, messages, and action prompts.

[ISO 9241-171:2008, 3.38]

3.19

variations

permitted alterations of an icon's non-textual representation that retain the icon's essential perceptual characteristics including discriminability

NOTE There are two types of variations dealt with in this part of ISO/IEC 11581, namely state variations and style variations.

4 Conformance

A system, application, or set of one or more icon(s) conforms to this part of ISO/IEC 11581 if all icons available to the user in the computer system, application or set conform to all the applicable requirements of Clauses 6 to 11 and any recommendations that a systematic evaluation has determined to be applicable.

If a product is claimed to have met the applicable recommendations of this part of ISO/IEC 11581, the procedure used in establishing requirements for developing and/or evaluating the software accessibility shall be specified. The level of specification of the procedure is a matter of negotiation between the involved parties.

5 Framework for icons

This clause provides a framework for use in the analysis, design, and implementation of icons. This framework is presented both at a high level and at a detailed level. Fully specifying icons involves more than just connecting representational elements to system functions.

This framework identifies a logical set of components of an individual icon to provide a basis for applying the guidance contained within this part of ISO/IEC 11581.

Figure 1 presents a high level framework for icons. It shows that there are four major interacting aspects that need to be considered in the design of icons: attributes that specify the internal identity of the icon (internal attributes); attributes that describe the icon in textual form (information attributes); attributes that are used in non-textual representations of the icon (representation attributes); and operations related to the icon. Internal attributes identify the intended function of the icon to software utilizing icons and allow it to distinguish between different icons. Description attributes provide user-oriented information about the purpose and use of the icon and provide a basis for the media-independent recognition of icons. Representation attributes are media dependent and provide rendering information to developers and systems. Operations provide the functionalities of an icon that are intended to be implemented by the system.

Figure 2 provides a detailed framework for icons that expands each aspect (identify, description attributes, representation attributes, and operations) into a number of specific components. It also recognizes that icons are often located and used within a group rather than individually, and that accessibility therefore involves grouping level operations. Each of the icon components, considered in this framework can contribute to the usability and accessibility of the icon and are the subject of guidance within this part of ISO/IEC 11581.

This model contains three different formats for icons: an internal computationally accessible format within the identity attributes, a textual format within the information attributes, and a set of non-textual formats within the representation attributes. Thus an icon can be referred to by its internal identifier, its label, or any of its rendered non-textual representations. Likewise, there is only one current state of an icon at any time, which also has computational (internal state), textual (textual state value), and rendered non-textual representation (including variations) formats.

An icon can be uniquely identified based on its internal identifier and unique instance number. The current possibilities of an icon can be uniquely identified by combining this unique identifier with the internal representation of the current state that it is in. An internal identifier is a machine readable code that uniquely identifies the functionality that the icon represents. The internal identifier is used to programmatically link all aspects of an icon together. Making an internal identifier explicit can facilitate the standardization of icons. In many current systems this is done implicitly via the programming routine/object used to implement the icon. The current state of the icon further identifies how the icon will respond to different user actions.

Information attributes are textual so that they can be formatted and presented to the user through the widest possible variety of media and modalities. The basic set of information attributes includes a label, a functional description, and a textual value of the current state. Labels are short names that are presented with any of the icon's non-textual representations, on demand, or on their own (in place of a non-textual representation, such as a graphic). Labels can be interacted with in a manner similar to the use of other icon representations. Functional descriptions are presented on demand to provide further elaboration on the purpose and/or use of an icon. Textual state values provide an indication to the user of how the icon will respond to different user actions. Labels, descriptions, and states can be translated to provide cultural and linguistic accessibility to icons. Where explicitly developed, these translations can be stored with an icon as optional additions to the set of description attributes.

Representation attributes describe how an icon can be rendered in specific modalities. They include information both on basic representations, which support universal recognition, and on their permitted variations. Variations can be used to individualize of the basic representation, both to present additional information (e.g. on state and/or instance) and to produce unique styles that will remain recognizable as representing the particular icon. While graphic representations are the most commonly used non-textual representations, this framework allows for a set of equitable renditions of icons in various modalities. Non-textual representations may include visual representations (e.g. graphics, gestures), auditory representations, tactile/haptic representations, and representations in any combination of these modalities. Where multiple renditions are possible, the system and/or the user can choose the one that is most appropriate for the context of use.

There are three basic operations that are part of all icons: selection, activation, and manipulation. Icon selection can be followed by either activating the icon or manipulating it in other manners. Separating icon operations, as considered in this framework provides greater accessibility by providing the user with an appropriate level of controllability. The basic manipulation operation involves obtaining one or more of the icon's information attributes. There are various types of optional manipulation operations including: individual icon manipulations (selecting a language for presenting information attributes, modifying the pallet for non-textual representation of an icon) and manipulations of the icon within a group of icons (moving an icon, removing the icon, restoring the icon). This framework also recognizes that some icons can involve additional optional manipulation operations.

NOTE Application program interfaces (APIs) are often used to implement the functionalities described in this part of ISO/IEC 11581.

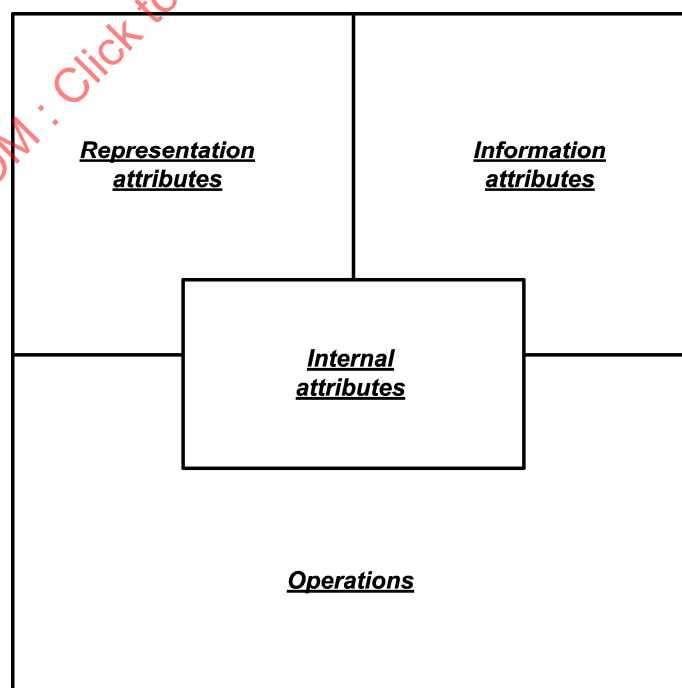


Figure 1 — A high-level framework for icons

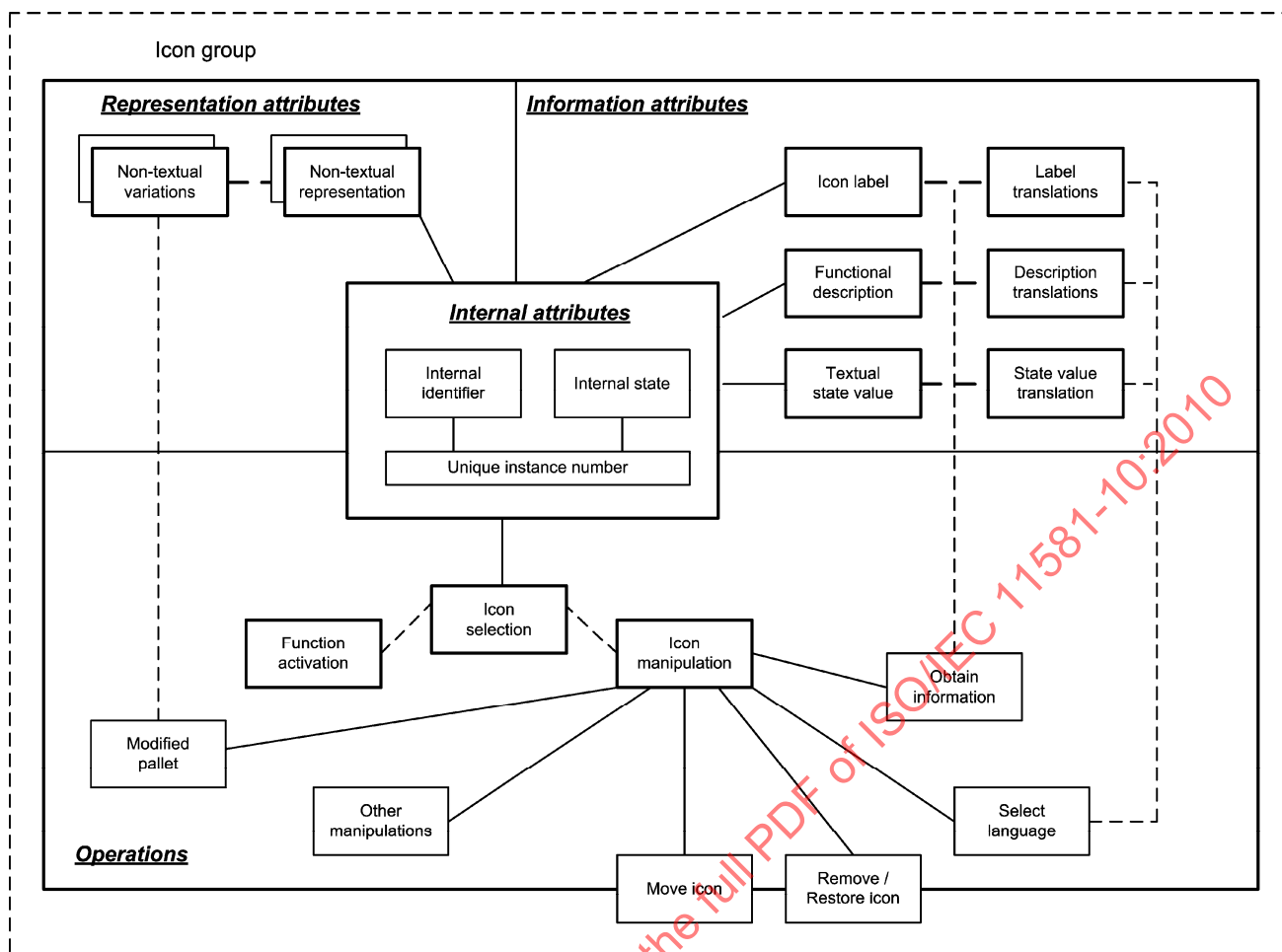


Figure 2 — A detailed framework for icons

6 Structuring icons

6.1 Icon components

Icons shall be composed of:

- a unique internal identifier;
- a set of permitted states;
- an icon label;
- an icon description;
- one or more non-textual representations (e.g. an icon graphic);
- a selection operation;
- an activation operation; and
- an operation that obtains the icon description.

Additionally icons may have:

- i) a unique instance number (for each instance of an icon implemented within an application);
- j) translations of description attributes;
- k) permitted variations of the non-textual representations; and
- l) one or more manipulation operations.

6.2 Icon graphics

All icons defined in various parts of ISO/IEC 11581 shall have a graphic representation defined for them and may have specific variations, including state variations and style variations defined for them.

NOTE This requirement only applies to ISO/IEC 11581. It does not apply to systems that do not use graphic icons.

6.3 Alternate renderings of icons

Icons defined in various parts of ISO/IEC 11581 may have additional non-graphical representations for their rendering in alternate formats and/or modalities.

NOTE This only applies to ISO/IEC 11581. It does not apply to systems that do not use graphic icons.

6.4 Separate aspects of icons

An icon's state, individual attributes and individual operations shall be separately accessible.

NOTE 1 This requirement does not prohibit providing access to meaningful groups of attributes and operations.

NOTE 2 The internal attributes are only intended for the use of the system and are not intended to be presented to the user.

6.5 Consistency of state information

The value of the state of an icon shall be consistent regardless of the format (internal, textual, or non-textual) used to present it.

6.6 Accessibility of description attributes

Icon description attributes (including labels, descriptions and any available translations) shall be readily available to users and to assistive technologies.

6.7 Accessibility of icon operations

Both a pointing device and a keyboard (or keyboard equivalent means) shall be able to be used exclusively to complete all icon operations.

NOTE Keyboard or keyboard equivalent methods can be used to complete operations in manners that are not based on direct manipulation.

7 Properties of icons

7.1 Representation properties of individual icons

7.1.1 Discriminability of states of icons

The representation of the current state (including but not limited to: available, selected, unavailable) of an icon shall be clearly discriminable from that used to represent other states of the icon.

EXAMPLE 1 When a graphically rendered icon is selected, the icon graphic is replaced by a visually distinctive variation of the icon graphic used when the icon was not selected.

EXAMPLE 2 Screen reader software presents the user with the status information “unselected” or “selected” whenever it presents the text label.

7.1.2 Comprehensibility of icons

- a) All available icons should be comprehensible within the environment for which they are intended.
- b) When first-time comprehension is not a usability requirement, then icons should be learnable.

7.1.3 Persistent presentation of icons

Icons that are currently unavailable should remain in the presentation (e.g. on the display), unless the user has explicitly allowed the system to self adapt.

EXAMPLE 1 The symbol of a printer which has run out of paper is dimmed to indicate that it is not available at the moment and that print commands cannot be executed.

EXAMPLE 2 Buttons are dimmed if they cannot be activated in connection with the currently selected object.

7.1.4 Animation of icons

Animation should not reduce the comprehensibility and recognizability of an icon.

NOTE Blinking rates are specified in ISO 9241-303, 5.6.3.

7.2 Properties of sets of icons

7.2.1 Consistency between icon representations

The non-textual representations of icons shall be consistent within the set of icons for which conformance is claimed.

EXAMPLE All graphic icons within a set of graphically presented icons, are presented using similar graphical style and a similar degree of realism.

7.2.2 Discriminability of icons from each other

All icons within an application shall be discriminable from each other.

NOTE In applications where multiple icons might have the same label (e.g. in an application used within a Web browser), icons can be made discriminable from each other by making the context of the icon explicit.

7.2.3 Discriminability of icons from adjacent objects

Icons shall be distinguishable from other adjacent objects including backgrounds.

7.3 Consistent behavior of icons

The way icons behave in a particular modality shall be consistent for all icons in the system.

7.4 Spatial properties of icons

7.4.1 Introduction to spatial properties

The rendering of all icons exists within some time and space, regardless of the media involved in the rendering. While the contents of 7.4 focus on graphical icons, the concepts contained in these requirements and recommendations may be modified to suit other modalities.

7.4.2 Opacity

The areas enclosed within the outline of an icon graphic shall be opaque. The remaining area outside the outline and bounded by the overall cell area can be opaque or transparent or any form between opaque and transparent.

7.4.3 Sensitive region

Icons shall have a sensitive region, typically an invisible overlay to the graphic. Its purpose is to provide an area, associated with each icon, to enable both user manipulation and interaction with other icons.

7.4.4 Overlapping of icons

Whenever an icon is moved to a position overlapping another icon, but not in such a way as to activate any sensitive regions, the overlapping sensitive region of the moved icon shall be on top of the other icon.

7.4.5 Layered icons

Where several icons are superimposed, the sensitive area of the uppermost should take precedence.

NOTE Typically it is not possible to directly interact with the lower ones through visual gaps in the uppermost icon.

7.4.6 Resizing icons

The design of an icon graphic should consider the needs to preserve comprehensibility and discriminability of the icon and its principal components when presenting them in different sizes/resolutions on different displays.

7.4.7 Considering changes in aspect ratios

The design of an icon graphic should consider the needs to make the appearance of the icon as similar as possible to the intended graphic when presenting them in different aspect ratios on different displays.

8 Attributes of icons

8.1 Internal attributes of icons

8.1.1 Implementation of internal identifier

The internal identifier, a unique instance number, and an internal representation of the state of the icon shall be implemented as a software identifiable property of all icons.

NOTE 1 This will allow software to recognize the purpose of the user interface object, action, or attribute regardless of how it is rendered.

NOTE 2 This identifier can be used to assist in the translation of user interface objects, actions, and attributes from one form of rendering to another to support accessibility.

NOTE 3 It is not intended that internal identifiers be presented to the user.

8.1.2 Consistent internal identifiers

Internal identifiers shall be used, wherever available from international or national icon standards.

NOTE Internal identifiers are used to identify the function the icon performs both within standards and within programs. They are not intended to be presented to end users.

8.1.3 Specification of internal identifiers

Where standardized internal identifiers are not available for a particular icon, the developer should specify an internal identifier for the particular icon.

NOTE This identifier can be used to assist in the translation of icon labels and descriptions from one form of rendering to another in order to support accessibility.

8.1.4 Specification of unique instance numbers

The assignment and specification of unique instance numbers should be done by the developer of the application that implements the icon, with a different instance number being assigned to each instance within the application.

8.1.5 Specification of internal representations of states

Where standardized internal representations of states are not available for a particular icon, the developer should specify a set of internal representations of states to be used for all instances of the icon.

NOTE All icons have at least one of the two icon states: AVAILABLE or UNAVAILABLE. Additional standard icon state values include: SELECTED and ACTIVATED. Further icon states can apply to some icons.

8.2 Description attributes

8.2.1 Access to icon labels

Users shall be enabled to access icon labels, whether those labels are visually presented or not.

EXAMPLE An icon depicting an eraser on a palette has no visible label. Although it is not shown, a non-visible label, such as an icon-variable name, is assigned a meaningful name ("eraser") that may be recognized and read to the user by assistive software when the object is selected or the pointer moves over it.

8.2.2 Position of icon labels

The location of any label relative to a non-textual representation of the icon shall be consistent within any environment or any collection of environments designed for use together.

EXAMPLE In an application, all the icon labels are placed consistently below the displayed icon.

8.2.3 Access to function descriptions

Users shall be enabled to access function descriptions, whenever they require further information beyond what a label provides about the purpose or use of an icon, whether those descriptions are presented visually or not.

EXAMPLE On mouse-over a description is displayed.

8.2.4 Access to textual state values

Users shall be enabled to access a textual version of the state value, whether this state information is visually presented as a variation of the icon or not.

8.2.5 Consistent description attributes

Labels, descriptions, and states available from international or national icon standards should be used (in preference to locally developed labels and descriptions) unless they are likely to cause confusion to users of the application.

8.2.6 Language of description attributes

Icon labels, descriptions, and textual versions of the state should be provided in the language of the user.

NOTE This guideline refers to all languages supported by the Universal Character Set as defined in ISO/IEC 10646.

8.2.7 Adaptation of description attributes

Icon labels, descriptions, and textual versions of the state may be translated to support cultural and linguistic adaptability and comprehensibility.

8.2.8 Presenting icon labels

- a) Textual labels should be presented for all icons where the same non-textual representation is used for several objects (e.g., all files created by the same applications).
- b) A textual label should be presented for icons where the meaning of the non-textual representation of the icon is not obvious or might not be clearly understood by the users.
- c) If presenting icon labels is not practicable (e.g. due to space limitation), system-initiated object identification (e.g. tool tip, quick info, balloon help) may be used as an acceptable alternative.

8.2.9 Short icon labels

Each label should be short enough to be easily rendered audibly, visually, and tactilely without inconveniencing the user.

8.2.10 Unique icon labels

Each label should be unique within its context.

8.2.11 Meaningful icon labels

Labels should be well-formed natural language containing standard words or names, rather than cryptic codes that the software might use to identify the element internally.

NOTE This means that each word in the label occurs in a standard dictionary or in electronic documentation for end-users included with the software.

8.2.12 Grammatical construction of icon labels

Labels should be grammatically consistent with the icons they describe.

EXAMPLE Nouns are used as labels of all icons representing stored data within an application and verbs are used as labels of all control icons within an application.

8.2.13 Typefaces of icon labels

Labels that are presented visually should be presented using sans serif typefaces.

8.2.14 State variations in non-textual representations

8.2.14.1 Using variations in non-textual representations to represent states

Distinctive non-textual representation variations shall be used consistently to distinguish between different states of an icon.

8.2.14.2 Consistency of state change variations

The conventions used to indicate the changes in state assumed by the object icon shall be used consistently for all icons within a program.

EXAMPLE Figure 3 illustrates how the symbol for a folder can be varied to represent (a) a closed folder, (b) a selected folder, and (c) an unavailable folder.

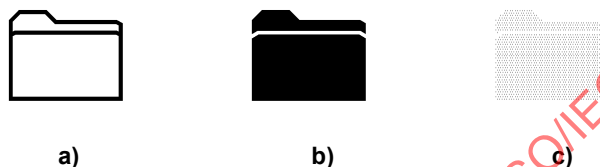


Figure 3 — Basic object icon: examples of state indication

8.3 Graphic representation attributes

8.3.1 Introduction to graphic representation attributes

While the contents of 8.3 focus on graphical icons, the concepts contained in these requirements and recommendations may be modified to suit other modalities.

8.3.2 Meaningful icon graphics

Icon graphics should:

- a) use widely recognizable symbols and make use of the best known version of a given symbol,
- b) show generic images and suppress unimportant details, and
- c) avoid culture-specific symbols.

NOTE Some types of culture-specific symbols include:

- mythological and religious symbols,
- puns and verbal analogies,
- body parts and gestures, and
- certain applications of color coding.

8.3.3 Metaphor

Any metaphor represented by the icon should be directly related to the functionality of the icon.

8.3.4 Consistent use of icon graphics

The meaning assigned to icon graphics shall be consistent throughout an application.

8.3.5 Retaining meaningfulness of icon graphics across multiple icons

When icon graphics are used as components of other icons, the meaning conveyed by the component shall be consistent across all uses of the component.

EXAMPLE Figure 4 illustrates how a graphic representing mail can be combined within graphics representing a folder or a document and how the meanings of both symbols in the combination are retained.

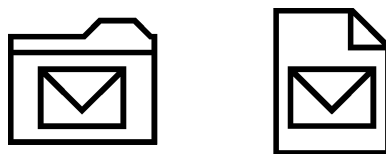


Figure 4 — Examples of icons used as components

8.3.6 Consistent appearance of icon graphics

The visual appearance of icon graphics should be consistent within the set of icons.

NOTE This means that within one set, icons are displayed using similar graphical style, e.g. a similar degree of realism.

8.3.7 Creating specialized versions of icons

Additional graphics may be incorporated into an icon to indicate more specific versions of an icon, however the resulting icons shall remain discriminable.

EXAMPLE Figure 5 illustrates how a symbol representing a document can have additional symbols inserted within it to provide more specialized information about the particular type of document.

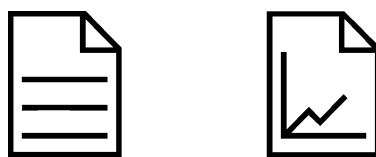


Figure 5 — Examples of incorporated graphics

8.3.8 Text within icon graphics

Language specific text should not be used within icon graphics, unless the meaning is universally identifiable.

NOTE The use of text within an icon makes it language specific and thus limits accessibility.

8.3.9 Color within icon graphics

8.3.9.1 Color coding in icon graphics

Color shall not serve as the only informative element to distinguish between icons or states of an icon unless the functional element represented is the color itself.

8.3.9.2 Meaningful colors in icon graphics

Where colors used in icon graphics are intended to convey meaning:

- a) color should not be used as the primary means of conveying this meaning;
- b) the colors should be used consistently throughout the application;
- c) the colors should be readily distinguishable by the user;
- d) the colors should come from the pallet of system supplied / user supplied standard colors; and
- e) the user should be able to modify the choices of colors attached to different meanings.

NOTE It is preferable to use no more than six colors in addition to black and white.

8.3.9.3 Distinguishable colors in icon graphics

Colors and color pairings that are widely distinguishable should be the main colors in icon graphics.

NOTE 1 Color pairs such as red/green and blue/yellow are indistinguishable by people with limited color perception.

NOTE 2 Saturated blue and other colors with a low luminance are often difficult to reliably discriminate and bring into clear focus, especially on a dark background.

NOTE 3 Foreground colors that are close together on the 1976 CIE UCS Chromaticity Diagram can be hard to distinguish.

NOTE 4 Background colors with high saturation (and bright white) make the foreground colors difficult to distinguish.

8.3.9.4 Using hue and intensity in icon graphics

Colors in icon graphics should use different hues and intensity so that colored objects can be distinguished even on a black and white screen by their different appearance.

8.3.10 Style variations in icon graphics

8.3.10.1 Allowing for style variations in icon graphics

Style variations may be used to adapt sets of icons to specific design styles or specific system technologies while retaining their essential perceptual characteristics.

8.3.10.2 Style variations of lines used in icon graphics

The style variations may involve line attributes such as: type, width, ending, connection, pattern, and colour.

EXAMPLE Figure 6 illustrates how a document folder remains discriminable despite variations in line width.

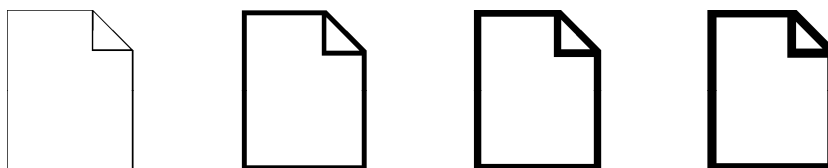


Figure 6 — Examples of variations in the line attribute “width”

8.3.10.3 Style variations in corners used in icon graphics

Style variations may involve corner attributes such as: rounding, beveling, radius, and connection, as illustrated in Figure 7.

EXAMPLE Figure 7 illustrates some variations in corners.



Figure 7 — Examples of corner attributes

8.3.10.4 Style variations in level of detail used in icon graphics

The level of detail may be increased to add to realism.

NOTE Photographic images or added graphics can be used to achieve a three-dimensional appearance of the icon.

EXAMPLE Figure 8 illustrates some variations in level of detail of an icon graphic.

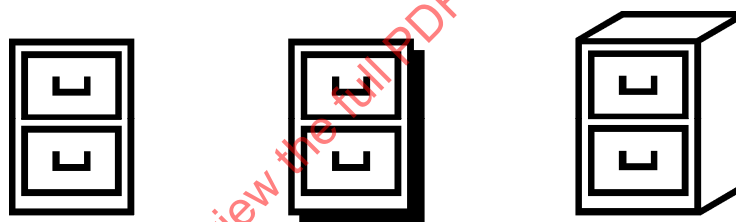


Figure 8 — Examples of levels of detail

8.3.10.5 Style variations in pattern or color used in icon graphics

Surface pattern or color may be varied globally provided this does not reduce the comprehensibility of the icons.

NOTE See 8.3.8 for further guidance regarding the use of color in icon graphics.

8.3.10.6 Additional style variations

Additional graphical elements should not reduce the recognisability of the icon.

9 Functions of icons

9.1 Separation of icon operations

Separate user actions shall be provided for the selection, activation, and manipulation of icons.

NOTE 1 This is important to prevent inadvertent activation or manipulation of icons.

NOTE 2 This does not prohibit users from purposely creating customized actions that combine a number of operations.

9.2 Selection of an icon

A specific selection operation shall be used consistently within the application to perform icon selection.

EXAMPLE A single click of a mouse button is used to select an icon.

9.3 Selection operation on a label

Selection of an icon shall be in accordance with ISO/IEC 11581-3. Selection of an icon label shall have the same result as selecting the non-textual representation of the icon (e.g. icon graphic).

9.4 Feedback on selection

An indication that an icon has been selected, but not yet activated, shall be provided by changing the internal state and any external states the icon from values representing "AVAILABLE" to values representing "SELECTED".

NOTE This can be referred to as a selection indication.

9.5 Activation of an icon function

A specific activation operation shall be used consistently within the application to activate the icon function.

EXAMPLE A double-click of a mouse button is used to activate an icon function.

9.6 Feedback on activation

An indication that an icon has been activated shall be provided by changing the internal state and any external states the icon from values representing "SELECTED" to values representing "ACTIVATED".

9.7 Feedback on activation completion

An indication that the activation of an icon has been completed shall be provided by changing the internal state and any external states the icon from values representing "ACTIVATED" to values representing "AVAILABLE" or to values representing some other state, e.g. "UNAVAILABLE" to indicate the state that follows the completion of the activation.

9.8 Opening an object icon

Opening an icon that represents an object shall allow access to the associated functionality or information of an icon and/or provide a view of the object represented by the icon.

9.9 Moving an icon

A specific move operation shall be used consistently within the application to change the position of an icon.

EXAMPLE Pressing and holding down the mouse button while moving the mouse is used to reposition an icon on a page.

9.10 Visualizing the movement of an icon

During any action involving user-controlled continuous movement of the icon, both the original position and the instantaneous current position of the icon should be made evident to the user.

9.11 Obtaining a functional description

The user shall be provided a method of obtaining a functional description without activating the icon.

EXAMPLE Pressing and holding down the left mouse button for longer than one second is used to have a functional description of the icon presented for the duration while the mouse button remains depressed.

9.12 Obtaining state information

The user shall be provided a method of obtaining textual information about the value of the icon's state without activating the icon.

EXAMPLE Pressing and holding down the right mouse button for longer than one second is used to have a value of the state of the icon presented for the duration while the mouse button remains depressed.

9.13 Immediate indication of icon operations

Immediate feedback concerning an icon operation shall be provided by a change in the state and/or other attributes (e.g. location) of the icon as presented to the user.

EXAMPLE 1 As soon as the user has selected a document icon, it becomes highlighted, indicating that the document is selected. As soon as the document is deleted, its icon disappears from the display.

EXAMPLE 2 If an icon is dragged from one position to another, the icon itself or an outline of it is continuously moved over the display corresponding to the movements of the pointing device.

9.14 Operations requiring user permission

Interacting with icons shall not destroy any user data without user permission.

9.15 User control of labels

The user should be able to control:

- a) whether or not individual labels and/or all labels are presented;
- b) the choice of available languages to be used for presentation of the labels; and
- c) the positioning of the label relative to the icon graphic.

10 Grouping icons

10.1 Separation of icons

Icon size should be optimized to maintain adequate target selectability, grouping and separation from adjacent user-interface elements to avoid errant selections.

10.2 Groups of icons

Icons should be presented in either conventional or logical groups.

NOTE ISO 9241-14:1997, 5.1.1 and 5.1.2 provide guidance on grouping based on conventional categories and logical categories, respectively.

EXAMPLE Object icons and action icons are placed in different groups within a menu, unless such groups conflict with other task requirements.

10.3 Consistent positioning

Icons and groups of icons that are presented in multiple locations within an application (e.g. on multiple pages) should be presented in the same location relative to other content in every location where they appear.

10.4 Ordering of icons

The ordering of icons within a group should be sequenced according to ISO 9241-14:1997, 5.3.

NOTE ISO 9241-14:1997, 5.3 provides guidance on the use of:

- consistency;
- importance;
- conventional order;
- existing order;
- order of use;
- frequency of use; and
- alphabetical use.

10.5 Consistent ordering

The ordering of icons within a group of icons that are presented in multiple locations within an application (e.g. on multiple pages) should be the same in every location where the icon group appears.

10.6 User control of icon groups

The user should be allowed to:

- a) re-order the icons within a group of icons;
- b) restore the default ordering within a group of icons;
- c) remove icons not required within a group of icons;
- d) restore the default set of icons within a group of icons;
- e) save the user's current set of icons; and
- f) restore a user saved set of icons.

11 Guidance regarding icons that relate to accessibility

11.1 System related icons

Icons intended to assist the elderly and people with disabilities should not focus on disabilities of users, but rather focus on the abilities of the system to meet various needs of the users.

EXAMPLE An icon showing the non-availability of a speaker is used rather than a broken ear to indicating that the output of sounds from the computer has been turned off.

11.2 Testing of icons for accessibility

Testing icons with users should include elderly users and users with disabilities among the test subjects to help determine the accessibility of the icons.