TECHNICAL REPORT

ISO/IEC TR 19766

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Information technology — Guidelines for the design of icons and symbols accessible to all users, including the elderly and persons with disabilities

Technologies de l'information — Lignes directrices pour la conception d'icônes et de symboles accessibles à tous les utilisateurs, y compris les personnes âgées et les personnes handicapées

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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.

In exceptional circumstances, the joint technical committee may propose the publication of a Technical Report of one of the following types:

— type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;

— type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;

— type 3, when the joint technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

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 TR 19766, which is a Technical Report of type 2, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 35, *User interfaces*.

Introduction

Computer icons are typically graphical objects that are interacted upon via direct manipulation means to achieve some specific functionality. The specialized abilities required to perform such interactions may limit the possible range of users and environments in which icons are used and thus may limit access to the underlying functionality provided by icons. This Technical Report identifies various attributes and operations that can be implemented as part of an icon or graphical user interface symbol to provide greater accessibility to its underlying functionalities.

Information technology — Guidelines for the design of icons and symbols to be accessible to all users, including the elderly and people with disabilities

1 Scope

This Technical Report provides recommendations relating to the design of icons to support accessibility by the elderly and people with disabilities. These recommendations assist accessible implementation of all icons for users. While these recommendations were developed to meet the needs of the elderly and people with disabilities, they can also provide greater accessibility to a wider range of users in a variety of different contexts.

This Technical Report introduces a set of attributes and operations that can be implemented as features of graphic icons to make the functionality of these icons accessible to the widest possible range of users. Textual attributes are emphasized in this Technical Report because they can be rendered in various alternate modalities. ISO/IEC 11581-1 provides guidance on the graphic aspects of icons. Specific renderings of these attributes (or of icons in general) are not dealt with as part of this Technical Report.

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 9241-3, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 3: Visual display requirements*

ISO 9241-14, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 14: Menu dialogues*

ISO/IEC 10646, *Information technology — Universal Multiple-Octet Coded Character Set (UCS)*

ISO/IEC TR 11580, *Information technology — Framework for describing user interface objects, actions and attributes*

ISO/IEC 11581-1, *Information technology — User system interfaces and symbols — Icon symbols and functions — Part 1: Icons — General*

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
icon
graphic displayed on the screen of a visual display that represents a function of the computer system

[ISO/IEC 11581-1]

3.2
icon function
capability of the computer system represented by an icon

[ISO/IEC 11581-1]

3.3
icon operations
predefined interactions with an icon that a user initiates

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

NOTE 2 This is in accordance with ISO/IEC TR 11580.

3.3.1
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 This is in accordance with ISO/IEC TR 11580.

3.3.2
selection indication
cue that indicates the selected icon, to which the user may apply a subsequent action

NOTE This is in accordance with ISO/IEC TR 11580.

3.3.3
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 This is in accordance with ISO/IEC TR 11580.

3.3.4
manipulation
controlling the selected icon without activating it

3.4
icon attribute
data item that modifies or describes some aspect of an icon

NOTE 1 “Attribute” is also used to refer to icon attribute within this Technical Report.

NOTE 2 This is in accordance with ISO/IEC TR 11580.

3.4.1
icon graphic
visual representation of an icon

NOTE “Graphic” is also used to refer to icon graphic within this Technical Report.

3.4.2
icon internal identifier
language-independent information used to internally define an icon that is intended to ensure system-based recognition of a particular icon

NOTE This is in accordance with ISO/IEC TR 11580.

3.4.3
icon label
language-dependent information used to supplement or provide an alternative to the icon graphic

NOTE 1 This can include information in various languages, e.g. English, Japanese, Blissymbols.

NOTE 2 This is in accordance with ISO/IEC TR 11580.

3.4.4
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 This is in accordance with ISO/IEC TR 11580.

3.5
state
status of an icon which is related to the currently permitted interactions with the icon

EXAMPLE Some states include: “active”, “available”, “selected”, “unavailable”.

NOTE This is in accordance with ISO/IEC TR 11580.

3.6
discriminability
ease with which a given icon can be distinguished from other icons that might occur in close spatial, temporal or contextual proximity

[ISO/IEC 11581-1]

NOTE Discriminability applies both to icon graphics and to icon labels.

3.7
variations
permitted alterations of an icon used to present state information and/or to adapt all icon graphics to specific design styles or specific system technologies while retaining their essential perceptual characteristics including **discriminability**

3.8
translation
alternate version of language-dependent components of an icon to suit specific cultural and linguistic audiences while retaining their essential content and discriminability

4 Framework for Establishing Accessibility of Icons

This clause provides a framework for identifying accessibility considerations in the analysis and design of icons. This framework is presented both at a high level and at a detailed level. This framework identifies a number of important components beyond the graphics and functions presented in ISO/IEC 11581-1 as a conceptual framework for the development of icon graphics. Fully specifying icons involves more than just connecting graphical elements to system functions.

This framework identifies a logical set of components of an individual icon to provide a basis for applying the accessibility guidance contained within ISO/IEC TR 19766.

Figure 1 presents a high level framework for establishing accessibility of icons. It shows that there are four major interacting aspects that need to be considered in the design of accessible icons: attributes that specify the internal identity of the icon; attributes that describe the icon in textual form; attributes that are used in graphical representations of the icon; 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.

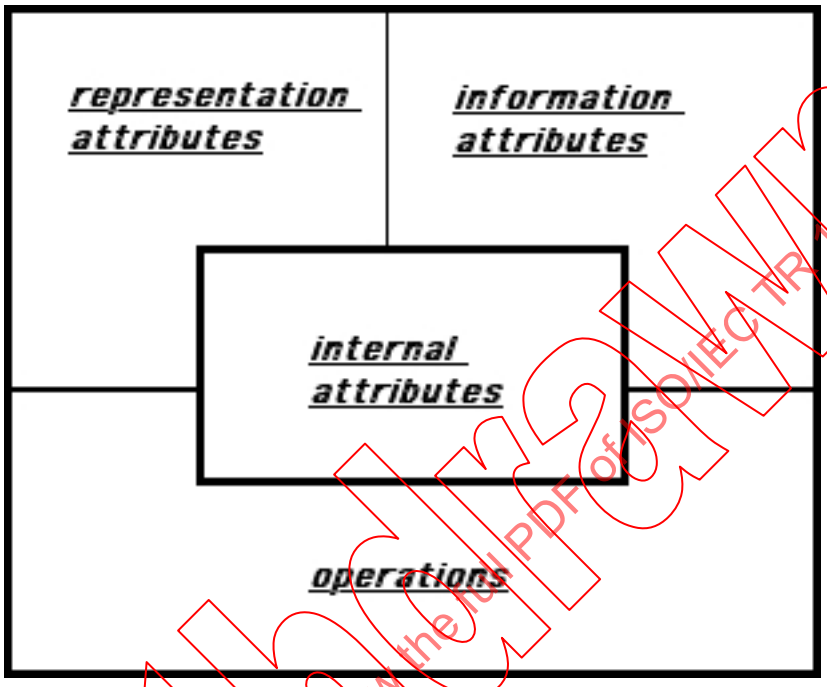

Figure 1 — A high-level framework for establishing accessibility of icons

Figure 2 provides a detailed framework for establishing accessibility of 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 accessibility of the icon and are the subject of guidance within ISO/IEC TR 19766. Properties identified in ISO/IEC TR 11580 are implemented as attributes of an icon in ISO/IEC TR 19766.

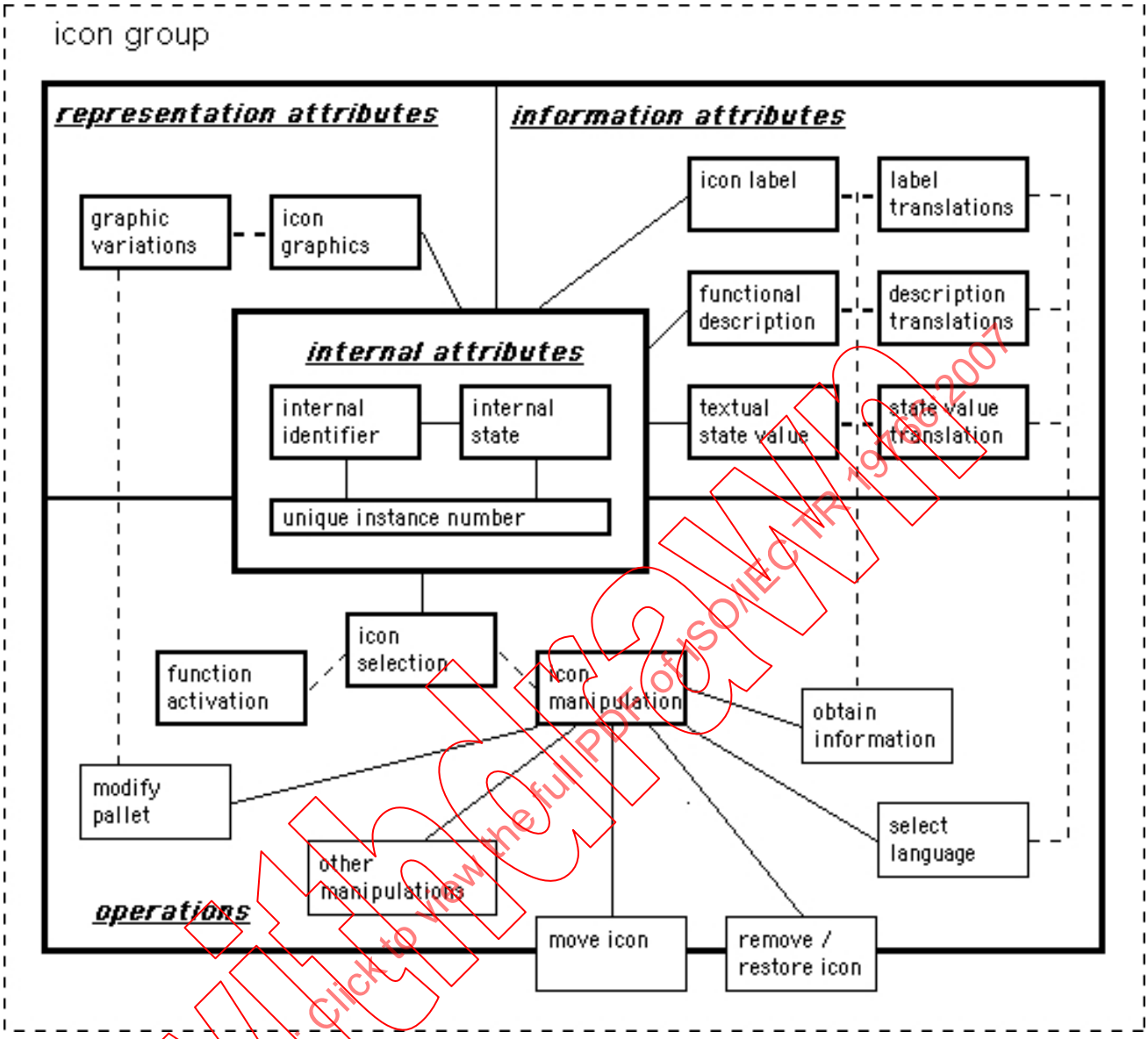

Figure 2 — A detailed framework for establishing accessibility of icons

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 the graphic, on demand, or on their own (in place of a graphic). Labels can be interacted with in a manner similar to the use of icon graphics. 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 include both the basic icon graphic and permitted variations on the graphic. Graphic variations are produced both to adapt the graphic to different contexts of use and to convey information on the current state of the icon. This framework recognizes that it is possible to develop alternate representations for icons that are used in non-visual media that can be stored with an icon as optional additions to the set of representation attributes. However, this Technical Report only provides guidance regarding improving the accessibility of visual (graphic variation) representation.

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

Icons include additional specific operations beyond the operational properties identified in ISO/IEC TR 11580. 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 graphical 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 Technical Report.

5 Structuring icons to support accessibility

5.1 Separate aspects of icons

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

NOTE 1 This recommendation 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.

5.2 Icon components

Icons should be composed of:

a) an unique internal identifier,

b) a set of permitted states,

c) an icon graphic,

d) an icon label,

e) an icon description,

f) a selection operation,

g) an activation operation, and

h) 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) variations of representation attributes, and

l) one or more manipulation operations.

5.3 Accessibility of description attributes

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

5.4 Accessibility of icon operations

Both a pointing device and a keyboard or keyboard equivalent device should 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.

6 Identifiability of icons

6.1 Internal attributes

6.1.1 Implementation of internal identifier

The internal identifier, a unique instance number, and an internal representation of the state of the icon should 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.

6.1.2 Consistent internal identifiers

Internal identifiers should 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.

6.1.3 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.

6.1.4 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.

6.1.5 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.

6.2 Comprehensibility of icons

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

6.3 Discriminability of icons from each other

All icons within an application should 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.

6.4 Discriminability of icons from adjacent objects

Icons should be distinguishable from other adjacent objects including backgrounds.

6.5 Consistency of state information

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

6.6 Discriminability of states of icons

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

EXAMPLE 1 When an 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 A screen reader presents the user with the status information “unselected” or “selected” whenever it presents the text label.

6.7 Persistent presentation of icons

Icons that are currently unavailable should remain 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.

6.8 Consistency of comprehensibility and discriminability

An icon should remain comprehensible and discriminable through any variations due to changes in its state.

6.9 Animation of icons

Animation should not reduce the comprehensibility and recognizability of an icon. Blinking rates are specified in clause 5 of ISO 9241-3.

[ISO/IEC 11581-1, clause 6.2.6]

7 Attributes of icons

7.1 Description Attributes

7.1.1 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.

7.1.2 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 Unicode standard ISO/IEC 10646.

7.1.3 Adaptation of description attributes

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

7.1.4 Access to icon labels

Users should 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.

7.1.5 Access to function descriptions

Users should 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.

7.1.6 Access to textual state values

Users should 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.

7.1.7 Displaying icon labels

a) Textual labels should be displayed for all icons where the same icon graphic is used for several objects (e.g., all files created by the same applications).

b) A textual label should be displayed for icons where the meaning of the icon graphic is not obvious or might not be clearly understood by the users.

c) If displaying 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.

7.1.8 Short icon labels

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

7.1.9 Unique icon labels

Each label should be unique within its context.

7.1.10 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.

7.1.11 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.

7.1.12 Position of icon labels

The location of any label relative to the icon should 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.

7.1.13 Typefaces of icon labels

Labels should be presented using simple, plain character shapes.

7.2 Representation attributes

7.2.1 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.

7.2.2 Consistent use of icon graphics

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

7.2.3 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.

7.2.4 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.

7.2.5 Color coding in icon graphics

Color should 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.

7.2.6 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, [ISO 9241-171]

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.

7.2.7 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.

7.2.8 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.

7.2.9 Using graphic variations to represent states

Distinctive graphic variations should be used consistently to visually distinguish between different states of an icon.

8 Functions of icons

8.1 Separation of icon operations

To prevent inadvertent activation or manipulation of icons, the selection, activation, and manipulation of icons should be performed by separate user actions.

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

8.2 Selection of an icon

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

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

8.3 Selection operation on a label

Selection of an icon should be in accordance with ISO/IEC 11581-3. Selection of an icon label should have the same result as selecting the icon graphic.

8.4 Activation of an icon function

A specific activation operation should 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.

8.5 Moving an icon

A specific move operation should 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.

8.6 Obtaining a functional description

The user should 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.

8.7 Obtaining state information

The user should 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.

8.8 Immediate indication of icon operations

Immediate feedback concerning an icon operation should 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.

8.9 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.

9 Grouping icons

9.1 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.

9.2 Groups of icons

Icons should be presented in either conventional or logical groups.

NOTE Clauses 5.1.1 and 5.1.2 of ISO 9241-14 provide guidance on grouping based on conventional categories and on logical categories.

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

9.3 Consistent positioning

Icons and groups of icons that appear visually on multiple pages should be displayed in the same location relative to other content on every page or screen where they appear.

9.4 Ordering of icons

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

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

— consistency,

— importance,

— conventional order,

— existing order,

— order of use,

— frequency of use, and

— alphabetical use.

9.5 Consistent ordering

The ordering of icons within a group of icons that appears visually on multiple pages should be on every page or screen where the icon group appears.

9.6 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.

10 Guidance regarding icons that relate to accessibility

10.1 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.

Annex A
(informative)
Sources of guidance

A.1 Introduction

Much of the guidance in this technical report was created by taking guidance from other ISO and ISO/IEC standards and technical reports and making it specific to icons. This guidance was organized based on the structure provided by ISO/TR 11580.

A.2 Sources for individual clauses

The following relates sources (found in the bibliography) that provided a basis for the icons specific recommendations in clauses of this Technical Report.

Clause in ISO/IEC TR 19766	Sources
3.1	ISO/IEC 11581-1 (clause 4.7)
3.2	ISO/IEC 11581-1 (clause 4.8)
3.3	Based on: ISO/IEC 11580 (clause 2.4)
3.3.1	Based on: {ISO/IEC 11580 (clause 2.10), ISO/IEC 11581-3 (clause 5.2), ISO 9241-16, W3C UAAG}
3.3.2	Based on: {ISO/IEC 11580 (clause 2.11), ISO 9241-16 (clause 3.21), ISO/IEC 11581-3}
3.3.3	Based on ISO TS 16071 (clause 3.3)
3.3.4	Based on ISO/IEC 11581-3 (clause 5.3)
3.4	Based on ISO/IEC 11580 (clause 2.2)
3.4.1	Based on ISO/IEC 11581-1 (clause 4.6)
3.4.2	Based on ISO/IEC 11580 (clause 2.6)
3.4.3	Based on ISO/IEC 11580 (clause 2.8)
3.4.4	Based on ISO/IEC 11580 (clause 2.9)
3.5	Based on: {ISO/IEC 11580 (clause 2.7), ISO 9241-16 (clause 3.23)}
3.6	ISO/IEC 11581-1 (clause 4.5)
3.7	Based on ISO/IEC 11581-1 (clause 6.3)

3.8	---

Clause in ISO/IEC TR 19766	Sources
4.0	Based on ISO/IEC 11580

Clause in ISO/IEC TR 19766	Sources
5.1	Based on WCAG (Guideline 1.3)
5.2	Based on ISO/IEC 11580
5.3	Based on: {ISO/IEC 11580, ISO 16071, ISO Guide 71, Section 255 § 1193.43 a, WCAG, DFI}
5.4	Based on:{ ISO 9241-16 (clause 5.4.2), ISO Guide 71, ISO/TS 16071 (clause 7.4.7), Section 508 § 1194.21 a, Section 255 § 1193.35 2 and 3, WCAG (clause 2.1), DFI p. 144}

Clause in ISO/IEC TR 19766	Sources
6.1.1	Based on ISO/IEC 11580 (clause 4.1.6)
6.1.2	Based on ISO/IEC 11580 (clause 4.1.3)
6.1.3	Based on ISO/IEC 11580 (clause 4.1.5)
6.1.4	---
6.1.5	Based on ISO/IEC 11580 (clause 4.1.4)
6.2	Based on: {ISO/IEC 11581-1 (clause 6.2.4 and 6.1.2), WCAG}
6.3	Based on: {ISO/IEC 11581-1 (Clause 6.2.4 and 6.1.2), WCAG}
6.4	Based on WCAG
6.5	Based on: {ISO 9241-16, ISO/IEC 18035, ISO Guide 71 (clause 8.12.5), Section 508 § 1194.21 c, ETSI EG 202 048, DFI p.121}
6.6	Based on ISO 9241-16
6.7	Based on: {ISO/IEC 11581-1 (Clause 6.1.2), ETSI EG 202 048}
6.8	ISO/IEC 11581-1 (clause 6.2.6)