INTERNATIONAL STANDARD

ISO/IEC 11581-10

First edition
2010-12-15

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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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.

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2   Normative references   (standards.iteh.ai)

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.

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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.
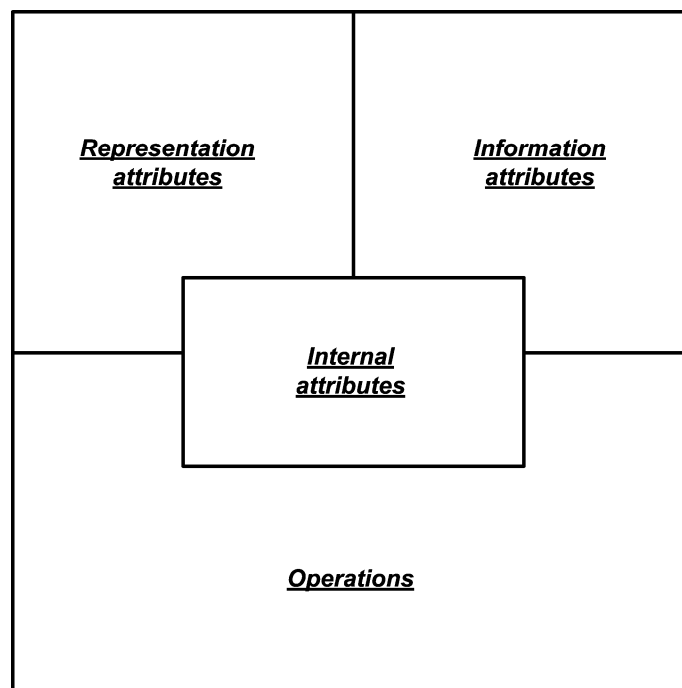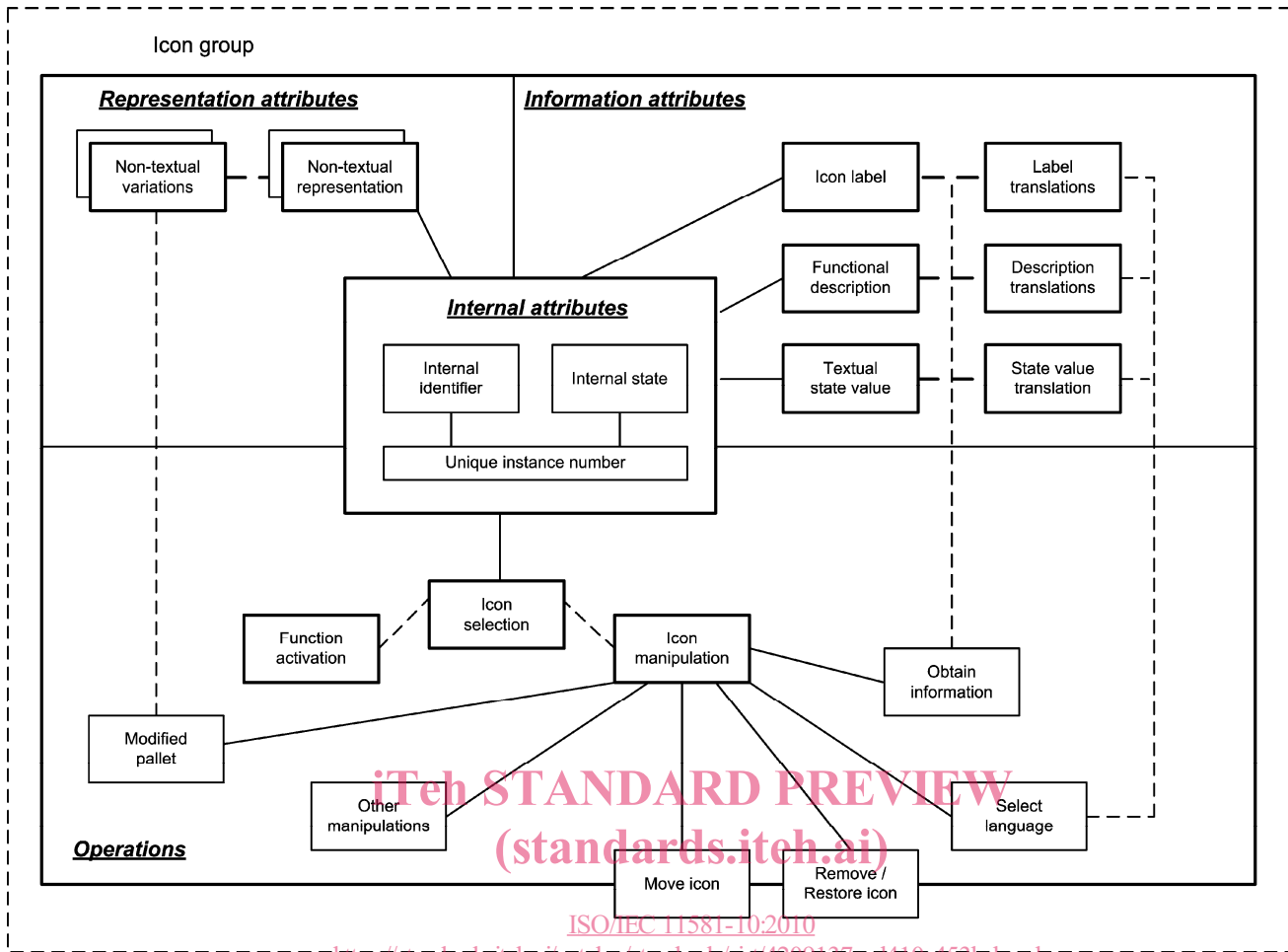

Figure 1 — A high-level framework for icons

5

Figure 2 — A detailed framework for icons

6 Structuring icons

6.1 Icon components

Icons shall be composed of:

a) a unique internal identifier;

b) a set of permitted states;

c) an icon label;

d) an icon description;

e) one or more non-textual representations (e.g. an icon graphic);

f) a selection operation;

g) an activation operation; and

h) an operation that obtains the icon description.