

First edition  
2007-06-15

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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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Tel. + 41 22 749 01 11  
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Published in Switzerland

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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.

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# 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.

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**3.3.3**

**activation**

initiation of the icon function of a selected icon [ISO/IEC TR 19766:2007](#)

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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]

[ISO/IEC TR 19766:2007](https://standards.iteh.ai/catalog/standards/sist/00dbb757-f534-4846-8d73-)

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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.

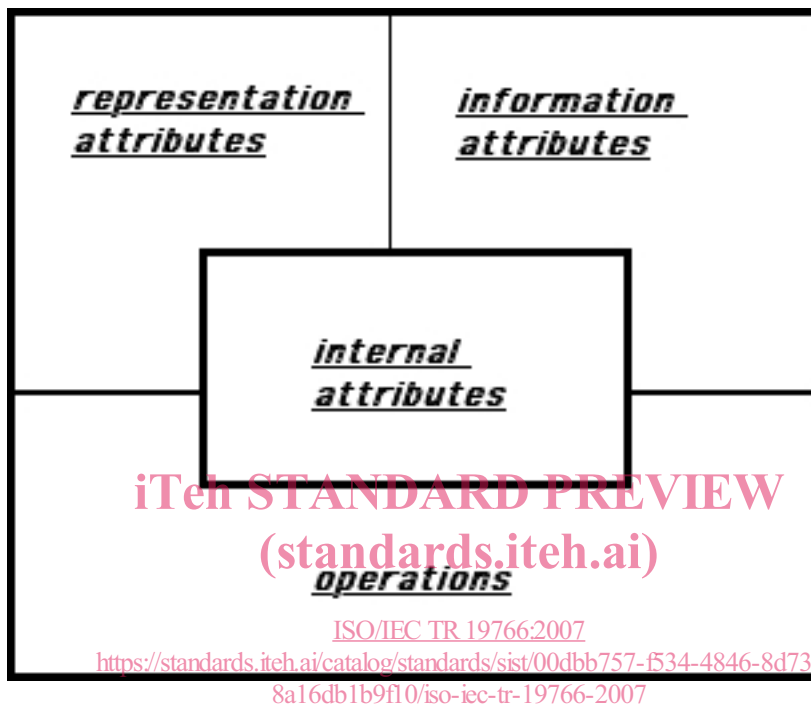
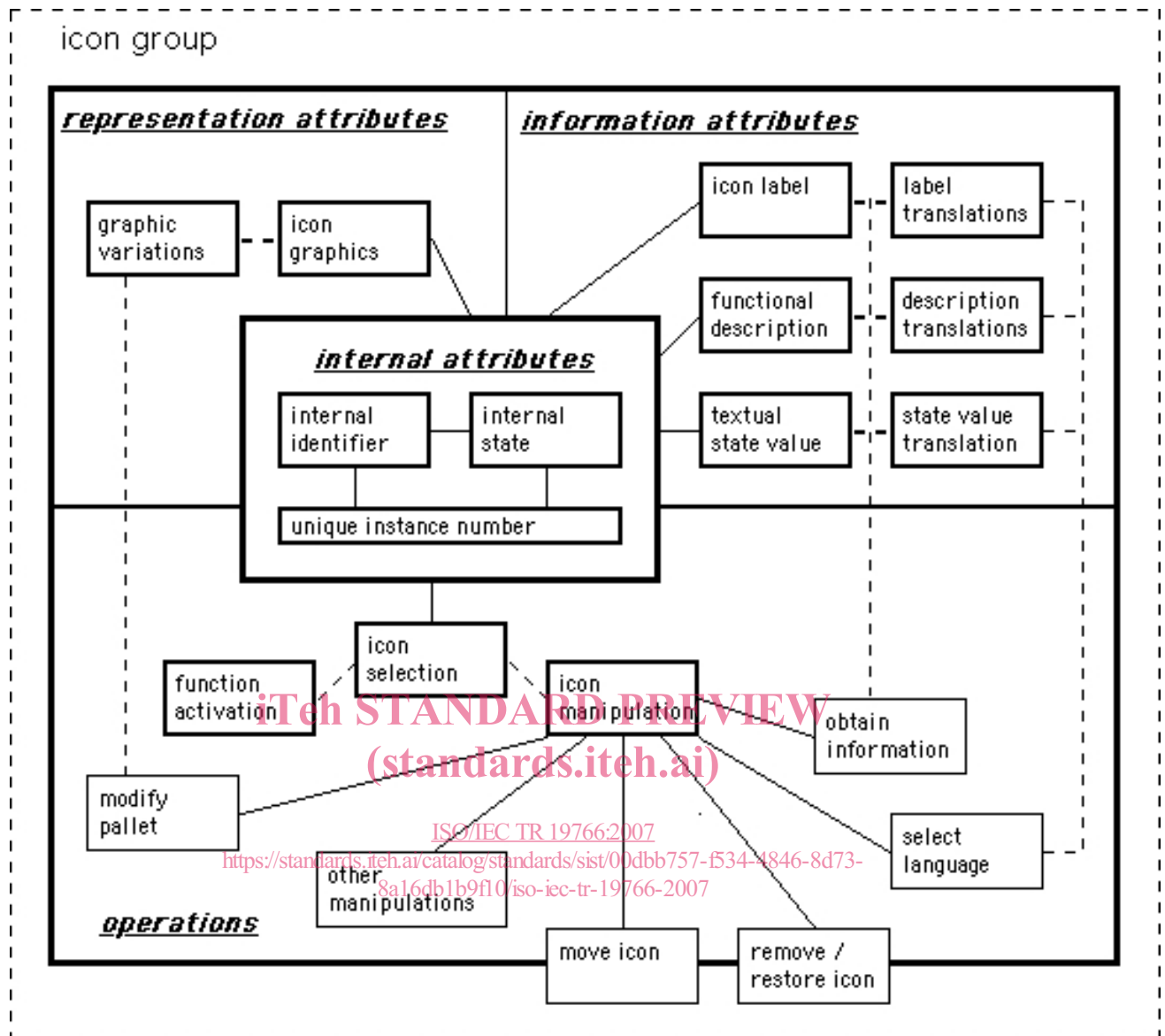


Figure 1 — A high-level framework for establishing accessibility of icons

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.