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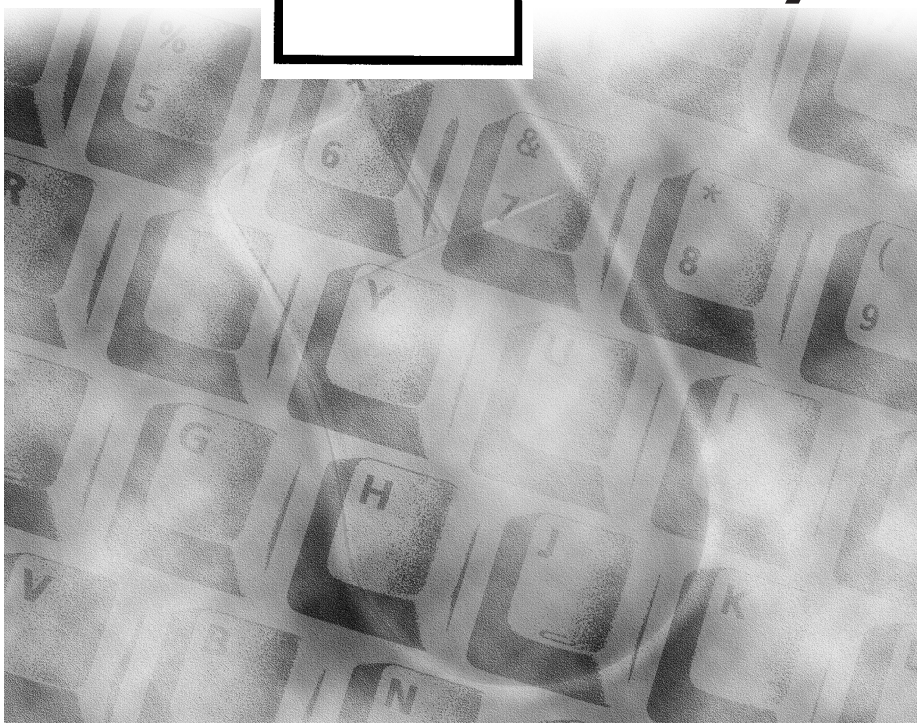
МЕЖДУНАРОДНАЯ ЗЛЕКТРОТЕХНИЧЕСКАЯ КОМИССИЯ

Document type	**Press article**
Title	**Icons in the eye of the beholder**
Source	**SC 35 Secretariat**
Date assigned	**2001-07-16**
Status	**This article was published in the issue of November 2000 of the ISO Bulletin and to put it in a nutshell, it might be entitled "User interfaces: searching for the future"**
Action Identifier	**For information**
N0 of pages	**6**

SPOTLIGHT

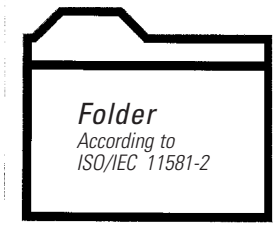
Icons in the eye of the beholder

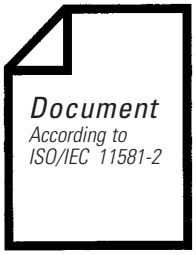


By Dr. Yves Neuville, Chair, and Mrs. France Lafargue, Secretary, ISO/IEC JTC 1, *Information technology*, SC 35, *User interfaces*

During this month of November 2000, ISO/IEC JTC 1/SC 35, *User interfaces,* will be celebrating its second birthday. Since coming into existence in San Antonio, Texas, it has set its sights on achieving results in three specific areas within the field of standardization assigned to it by ISO/IEC JTC 1, *Information technology*.

Two lie downstream from the standardization process, and deal with *Icon symbols and functions* for the one, and *User system interfaces for mobile tools* for the other. The third lies upstream, and focuses on a field enjoying a new surge of interest, *Cultural and linguistic adaptability* – a key area of action recognized by JTC 1 to improve the quality of future standards.





Icons – a language-independent means of communicating information

Hot off press this year are three parts of the ISO/IEC 11581 series *Information technology – User system interfaces and symbols – Icon symbols and functions*.

In this standard are graphical symbols for use on a screen, that users can manipulate and interact with. Such symbols are known as "icons". An icon is a "*graphic displayed on the screen of a visual display that represents a function of the computer system*". They are part of a graphical interface that can facilitate the user's ability to learn, understand and remember functional elements of the system, and aid in the manipulation of these elements. Their purpose is to facilitate interaction between computer-based applications (software products) and users.

Consistency in the presentation and operation of icons is an important issue as is legibility when these icons are displayed in small sizes. Then there is a requirement to standardize both the presentation of icons and the objects and associated functions that they represent while providing a *language-independent means of communicating information* to the user.

> "[Icons'] purpose is to facilitate interaction between computer-based applications (software products) and users."

There are various categories of icons. An outline of the five categories contained in the standard is given in the table below.

A multi-part standard, ISO/IEC 11581 applies to software products providing office applications such as document production, desktop publishing, finance, and planning that present their functions via a graphical user interface (GUI). The standard describes the graphical aspects and their associated functions necessary to allow a user to operate the GUIs of differing software products. It provides a set of requirements and recommendations to enable the development and design of different types of icons to represent objects and functions on computer screens.

The state of the standard is as follows:

- The first three parts are available.
- Parts 4 and 5 are still in the hands of experts
- Part 6 was published on 1999-02-01. *(See table overleaf)*.

The icons contained within the various parts of this standard have been selected from surveys of commonly used functions and objects together with their most commonly used graphic metaphors.

Part 1: General	Provides a framework for the development and design of icons and their application on screens.
Part 2: Object icons *Object icons are a subset of icons that represent the objects making up the domain of a system or application that users manipulate when carrying out their jobs.*	Applies to icons that are shown on a screen, that users can manipulate and interact with, and that represent data, or computer functions. It describes icons that represent functions by association with an object and that can be moved and opened. This part contains requirements and recommendations for 19 commonly used object icons
Part 3: Pointer icons *Pointer icons are those icons that are used to indicate a focus within a system or application.*	Describes user interaction with and the appearance of pointer icons that are logically attached to a physical input device, and that the user manipulates to interact with other screen elements. It specifies how pointer icons on a screen change appearance to give users feedback. This part contains requirements and recommendations for eight commonly used pointer icons.
Part 4: Control icons *Control icons are a subset of interactive symbols and graphical elements displayed on the screen to indicate an area of task control within the domain of a system or application that users manipulate in doing their work.*	Defines user interaction with and appearance of the graphical elements that provide task control for the user of the computer display. These control icons can be used to operate on windows, lists, and other graphical elements that provide dialogue interaction between the system and the user. This part contains requirements and recommendations for 14 commonly used control icons.
Part 5: Tool icons *Tool icons are a subset of the interactive icons that modify graphical or text elements of an application by association with real life tool objects. These icons represent tool functions such as drawing, painting, or modifying graphical elements.*	Describes user interaction with and appearance of tool icons on the screen. It also specifies the relationships between tool and pointer icons. Part 5 contains requirements and recommendations for 20 commonly used tool icons.
Part 6: Action icons *Action icons are icons which act upon a selected source and/or target, and provide a single step access to functions typically also available via a menu. Action icons provide more direct access to functions by representing those text commands graphically.*	Describes user interaction with and the appearance of tool bar or "action" icons. Action icons represent actions by association with objects that prompt the user to recall the intended actions This part contains requirements and recommendations for 23 commonly used action icons.

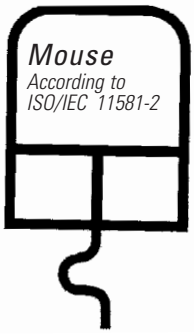
These icons are intended to be used by persons involved in the design, implementation, and evaluation of icons for graphical user interfaces of computer-based office applications, and by providers and customers that use software applications and products.

To see this standard in action, visit the IBM Ease of Use web site at http://www-3.ibm.com/ibm/easy/eou_ext.nsf/publish/558 and then to "Downloads" and then to "Icons". Here you will discover a comprehensive collection of ready-to-use Windows icons and icon components, many conforming to ISO/IEC 11581.

Two new standards addressing *World Wide Web Browser* and *Multimedia navigation icons* have passed the NWI (New Work Item) ballot and are about to swing into development.

- ISO/IEC 18035, *Information technology – Icon symbols and function for* controlling multimedia applications: the New Work Item (NWI) has been recently approved, and the WD (Working Draft) is in preparation.
- ISO/IEC 18036, *Icon symbols and functions for World Wide Web browsers*: the NWI has been recently approved, and the WD is in preparation.

A further standard for icons and symbols for use on personal, mobile, communication devices is currently under preparation.



Building the mobile device scene for the future

To meet trendy technology needs for standards particularly in fields where innovation is rapidly expanding as is the case of mobile products, SC 35 has recently embarked on the standardization of user interface specification for such products.

This new surge of interest is reflected in ISO/IEC 18021, *Information technology – User Interface for mobile tools*.

Dr. Yves Neuville, Chairman, ISO/IEC JTC 1/SC 35, User interfaces

France H. Lafargue, Secretary, ISO/IEC JTC 1/SC 35, User interfaces

Richard Hodgkinson, former Chairman SC 35, and Editor of the ISO/IEC 11181 series

Alain LaBonté, Project Editor of the ISO/IEC 9995 series

Working for clear, easily recognizable icons for universal end-user comprehension.

This International Standard defines user interface specifications for a MoBile Tool (MBT) capable of interchanging data with a server any time and anywhere. MBT is a small-size device, such as personal digital assistant (PDA) and smart phone. In the International Standard, it is defined as "*a mobile communication device with a small display and a database*".

When the MBT works in conjunction with server machines or other computers, it becomes more powerful and more useful. And when the MBT exchanges data with other devices via a narrow communication line, as in wireless communications, new user interfaces are required to meet user's needs such as high usability, reliability and easy-to-use features. Standardizing these new user-interfaces is a key point for MBT users all over the planet.

This International Standard specifically defines the following two user interfaces.

1. The user interface for obtaining user approval in advance when MBT client's database is updated via a communication link, or when the data in his database is transmitted to another database.
2. The user interface for providing feedback to the user, after the MBT client's or the MBT server's database has been updated via a communication link, or data in MBT client's database has been transmitted to another database.

Standards to be considered for world languages

A great leap forward has already been made with standards to express written languages.

Among these are the following:

– **ISO/IEC 10646- 1: 1993**, revised this year, *Information technology – Universal multiple-octet coded character set (UCS)* – Part 1: *Architecture and basic multilingual plane*, permits an exchange of characters in all languages, thus avoiding conversions from one set of characters over to the other – necessary for data exchange between computers with different character sets.

– **ISO/IEC 8859-15: 1999**, *Information technology - 8-bit single-byte coded graphic character sets* – Part 15: *Latin alphabet N° 9*, that enables expressing Finnish, Irish, French, including all characters with accents, and the "Euro" character.

– **ISO/IEC 9995: 1994** (8-part standard), *Information technology – Keyboard layouts for text and office systems* (Refer to "Keyboards") combined with ISO/IEC 14755, *Information technology – Input methods to enter characters from the repertoire of ISO/IEC 10646 with a keyboard or other input device.*

and last but not least, a draft standard such as developed by JTC 1/SC 22/WG 20, *Internationalization*:

– **ISO 14651**, International string ordering, addressing sorting character strings, currently under DIS ballot.

Culturally and linguistically correct

In 1998, JTC 1 established a "*Cultural and Linguistic Adaptability and User Interface Technical Direction*", CLAUI in short, which includes SC 35, SC 2 (character coding), and SC 22/WG 20 (internationalization of applications).

The former existing User interface and Coded character sets Technical directions were thus merged into one single TD (Technical Direction) to satisfy the strategic option of cultural and linguistic adaptability required by JTC 1.

The ability to design products that are adapted to different languages and cultures is a vital priority for manufacturers who must be present on an increasing number of markets, and is a prerequisite to maximize the IT markets, and the general economic growth as a consequence.

This priority becomes crucial when these products are defined and specified in International Standards that could contradict those goals, if sufficient attention is not devoted to these issues. It has thus been noticed that standards need to be adapted to cultural and linguistic requirements that are particular to a nation, a culture, a society or a given geographic area. If International Standards can already include clauses dealing with cultural and linguistic requirements, the legal burden is hopefully alleviated and the risk of surprises on non-tariff barriers questions in international trade diminished.

To address this "hot" topic, JTC 1 assigned the development of a methodology to the CLAUI TD. Dealing with direct user interaction, SC 35 in particular has as a priority within its scope the meeting the JTC 1 requirements for cultural and linguistic adaptability.

SC 35 is about to take the necessary steps to develop a process taking account of cultural and linguistic adaptability in International Standards. This is based on a methodology *"to identify JTC 1 projects having an impact or raising concern regarding CLAUI issues"*.

Its first foray in its efforts to reach that goal is discussed below.

> "Consistency in the presentation and operation of icons is an important issue as is legibility when these icons are displayed in small sizes."

As a preamble, the TD on CLAUI has defined the term "Cultural and Linguistic Adaptability" as the ability for a product, while keeping its portability and interoperability properties, to:

– be internationalized, that is, be adapted to the special characteristics of national languages and the commonly accepted rules for their use, or of cultures in a given geographic region;

– take fully into account the needs of any category of users.

This definition is very wide and includes of course the ability to enter, display and print all characters proper to the world national languages, as well as the ability to sort, search and process in all sorts of manners those different languages according to user needs. Catering means also being able to deal with the different calendar systems in use in the world, as well as with different measurement systems and different presentation of data. This is what SC 2, SC 22/WG 20 and SC 35 have traditionally been busy doing over the last decade and more.

The term "internationalization" is defined in ISO/IEC TR 11017, *Information technology – Framework for internationalization/Technologies de l'information – Cadre général pour l'internationalisation* (produced by SC 22/WG 20) as "a process of producing an application platform or application which is easily capable of being localized for (almost) any cultural environment".

The Business Team/Electronic Commerce (BT/EC) also recognizes requirements for neutral identification of metadata to be exchanged throughout the world (i.e. in global trade, it is easier, and it may be crucial, for example, to use catalog numbers rather than item names in a given language).

However, with multimedia more than coming of age, with standards aiming at high-level application areas, there is more than meets the eye within the infrastructure required to enable the application platform for correct cultural and linguistic adaptability or the direct translation of catalog numbers into the user's language – albeit these elements are essential.

One International Standard that would for example prescribe that a particular standardized electronic document shall use a particular language with or without others could go against national laws and create potential conflicts, the legal solutions to which could involve quite complex and long international court cases.

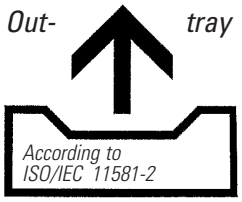
Furthermore, other ISO/TCs also look forward to JTC1 initiatives to deal with Cultural and Linguistic Adaptability: ISO/TC 211, *Geographic information* (on *Geomatics*, Spatial reference information) in particular has specific concerns about the ability to deal with geographic metadata in GPS applications, in particular, or in geographical mapping requirements.

More recently the IETF (Internet Engineering Task Force) architecture board sent a request to JTC1 for expedited standardization of some items to facilitate multi-lingual, multi-cultural use of the WWW (World Wide Web). While such elements as country and language codes are required to be stable, the political world map continues to change and languages to evolve. A standard way to deal with such issues has to be defined. Furthermore, the ubiquitous use of the World Wide Web has created requirements for URL identification that respects world languages and customs, while the past requirements and habits continue to be important for user input stability.

Already the JTC1 New Work Item Proposals have been updated to include a question asking if requirements for cultural and linguistic adaptability are known. This at least gives a hint to International Standards-developers that these issues have to be considered.

The CLAUI Technical Direction has, then, to harmonize the work that has already been done, to produce guidelines and checklists that all International Standard developers should be aware of.

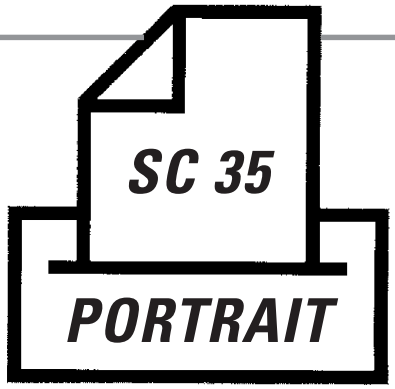
SC 35 is preparing a New Work Proposal for a Technical Report on guidelines for drafting JTC 1 International Standards so as to respect the CLAUI principles. Its work should follow the previous recommendations of the TD, such as unambiguous cultural-neutral identifiers, character-coding directions, multilingual provisions in metada elements…



Call for expertise and participation

One major problem is that work done within JTC 1 and its SCs is often not widely known. Even IETF have had issues that have run into problems concerning sorting and matching, and functions specifications which are urgently required for consistent URL processing of world languages.

As we see, these issues are very much of our age. Experts from companies, government agencies, unions, users and consumers' organizations are expressly solicited in the CLAUI TD to deal with them. Interested persons must be aware of horizontal issues as well as vertical ones. This is not an easy task, but World Trade and economic expansion depend very much on the harmonization of such issues in International Standards. □



Date of birth: 22 November 1998

Genealogy: directly descended from ISO/IEC JTC 1/SC 18/WG 9, ISO/TC 97/SC 18/WG 9, *User system interface and symbols*, and ISO/IEC JTC 1/WG 5, *User interfaces*

Relationships and credentials:

1. Within the JTC 1, Cultural and linguistic adaptability and user interface Technical Direction, SC 35 is grouped together with SC 2, Coded character sets, and SC 22/WG 20, Programming languages, their environments and system software interfaces/Internationalization

2. To boost new developments in user interface standardization areas of work, an Ad-hoc Group on emerging user interface technology has been created.

3. To better manage WGs, an Ad-hoc Group on SC 35 management was brought into existence.

Scope:

"Standardization in the field of interfaces between users (including people with special needs) and systems, encompassing input and output devices in information technology environments, with the priority of meeting the JTC 1 requirements for cultural and linguistic adaptability".

The standardization work on SC 35 includes the following areas:

– interfaces between users and devices, such as keyboards, mice, pointers, pens, visual displays, and forms of audio and tactile input/output, with the emphasis on functionality

– rules for system control by voice, vision, movement, gestures, etc.

– presentation techniques, icons, graphical symbols, etc.

– dialogue control and navigation in interactions between humans and systems assistance and tutoring

Structure:

SC 35 currently comprises four Working Groups

- WG 1, Keyboard and input interfaces
- WG 2, User interface interaction
- WG 3, Graphical symbols
- WG 4, User interfaces for mobile devices

and one group on *Voice messaging* that meets according to need.

Current projects:

Keyboards

- Multi-part standard ISO/IEC 9995, *Information technology – Keyboard layouts for text and office systems*: the consolidation and revision of several parts of of this multi-part standard is underway.
- ISO/IEC TR 15440, *Information technology – Technical Report of future keyboards & other associated input devices & related entry methods*: the WD stage is starting to move fast forward.
- Maintenance of a database on the SC 35 web site containing national keyboard layouts: the way to developing a keyboard "register" is being paved.

User interfaces

- ISO/IEC 11581-4, Information technology – User system interfaces and symbols – Part 4: Control icons is at 2nd CD stage
- ISO/IEC 11581 Part 5: Tool icons, is currently undergoing FCD ballot
- ISO/IEC 18021, Information technology – User interfaces for mobile multimedia communication devices, is currently undergoing 2nd CD ballot
- ISO/IEC 18035, Information technology – Icon symbols and functions for controlling multimedia applications : the NWI has been recently approved, and the WD is in preparation.
- ISO/IEC 18036, Icon symbols and functions for World Wide Web browsers: NWI recently approved, and WD under preparation.

Symbols

- ISO/IEC 13251, Information technology – Collective standard – Graphical symbols for office equipment, bilingual English-French version, is at CD stage.

User interface for mobile devices

- ISO/IEC 14754, Information technology – Pen based interfaces – Common gesture for text editing with Pen-based systems, was published 1 June 1999.

At its Plenary meeting in May 2000, the decision was taken unanimously to adopt the name *User interface for mobile devices*, in place of *Gesture controlled interfaces* to broaden the spectrum of its activities.

Meeting news and an invitation:

Recent event

A coordination meeting of the Cultural and Linguistic adaptability and User Interface Technical Direction of JTC 1 was held between 18 and 19 October in Nice, France.

Forthcoming event

The 5th combined SC 35 Plenary and Working Groups meeting will be held in Quebec from 18 to 22 November 2000.

A farewell to snail mail:

To speed up the pace of standardization, all SC 35 documents are accessible on the SC 35 web site at the following addresses: **(http://forum.afnor.fr/afnor/WORK/AFNOR/GPN2/Z62A/index.htm** or **http://www.jtc1.org: subcommittee 35)**