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Ergonomics of human-system interaction —

Part 125: Guidance on visual presentation of information

Ergonomie de l'interaction homme-système —

Partie 125: Recommandations relatives à la présentation visuelle d'informations

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 159, *Ergonomics*, Subcommittee SC 4, *Ergonomics of human–system interaction*.

This first edition of ISO 9241-125, together with ISO 9241-112, cancels and replaces ISO 9241-12:1998, which has been technically revised with the following changes:

— specific guidance relating to the presentation of visual information has been updated and extended (recommendations for presentation of information in other modalities will be addressed in future parts of ISO 9241);

— the characteristics of presented information have been elaborated with respect to ISO 9241-112;

— textual descriptions of the figures (alt text) have been added to enhance accessibility for sight-impaired users (in PDF, these are “pop-ups” which appear when the cursor is passed over the figure).

A list of all parts in the ISO 9241 series can be found on the ISO website.

Introduction

ISO 9241 is a multi-part International Standard that deals with both the hardware and software ergonomic aspects of human-system interaction.

ISO 9241-125 is intended for use by the following types of users:

a) the user interface designer, who will apply it during the development process.

b) the buyer, who will reference it during the product procurement process, and whose end users will gain from the potential benefits it provides.

c) project managers who are responsible for managing development processes.

d) designers of user interface development tools to be used by interface designers.

e) writers of software industry user-interface guidelines to be used by interface designers, e.g. “interface style guides”.

Guidance relating to presenting information provided in International Standards is intended to be applied to user-interface guidelines published by industry sources.

The ultimate beneficiary of this document will be the end user of the presented information. Although it is unlikely that the end user will read the standard or even know of its existence, its application by designers, buyers, and evaluators should provide user interfaces that are more usable, consistent and that enable greater productivity.

This document consists of general recommendations and conditional recommendations concerning presentation of information. General recommendations apply to most users, tasks, environments, and technology. In contrast, conditional recommendations are recommendations that apply only within the specific context for which they are relevant (e.g. particular kinds of users, tasks, environments, technology). Conditional recommendations have an “if-then” structure. The recommendations were developed primarily by reviewing the existing relevant literature and empirical evidence, then generalizing and formulating this work into recommendations for use by the interface designer and/or evaluator.

Ergonomics of human-system interaction —

Part 125: Guidance on visual presentation of information

1 Scope

This document provides guidance for the visual presentation of information controlled by software, irrespective of the device. It includes specific properties such as the syntactic or semantic aspects of information, e.g. coding techniques, and gives provisions for the organization of information taking account of human perception and memory capabilities. Those of its provisions that do not apply to specific types of visual interfaces clearly indicate any limitations to their applicability. It does not address specific details of charts, graphs or information visualization.

This document can be utilized throughout the design process (e.g. as specification and guidance for designers during design or as a basis for heuristic evaluation). Its provisions for the presentation of information depend upon the visual design approach, the task, the user, the environment and the single or multiple technologies that might be used for presenting the information. Consequently, this document cannot be applied without knowledge of the context of use. It is not intended to be used as a prescriptive set of rules to be applied in its entirety but rather assumes that the designer has proper information available concerning task and user requirements and understands the use of available technology.

Some of the provisions of this document are based on Latin-based language usage and might not apply, or might need to be modified, for use with languages that use other alphabets. In applying those that assume a specific language base (e.g. alphabetic ordering of coding information, items in a list), it is important that care is taken to follow its intent of the standard when translation is required to a different language.

This document does not address auditory or tactile/haptic presentation of information or modality shifting for the presentation of visual information in other modalities.

NOTE ISO 9241-112 provides high-level ergonomic guidance that applies to all modalities.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 9241-171:2008, *Ergonomics of human-system interaction — Part 171: Guidance on software accessibility*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

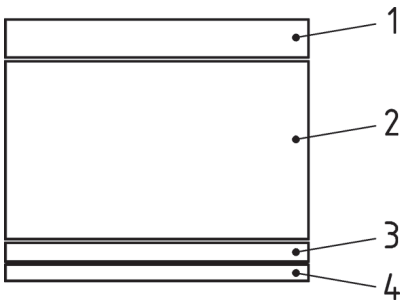
3.1
accessibility
extent to which products, systems, services, environments and facilities can be used by people from a population with the widest range of user needs, characteristics and capabilities to achieve identified goals in identified contexts of use

Note 1 to entry: Context of use includes direct use or use supported by assistive technologies.

[SOURCE: ISO 9241-112:2017, 3.15]

3.2
area
section or region of a display or window

Note 1 to entry: Figure 1 shows an example of a possible layout of different areas.



Key
1 identification area
2 input/output area
3 control area
4 message area

Figure 1 — Possible layout of different areas

3.2.1
identification area
area (3.2) where the title of the displayed information is provided

Note 1 to entry: The identification area can include an indication of the user's current location and task. It may also identify an application, file, or working environment.

3.2.2
input/output area
area (3.2) where information is received from users and/or presented to users

Note 1 to entry: This terms recognizes that an area can be used for both input and output, but does not necessarily have to be used for both.

3.2.3
control area
area (3.2) where control information and/or controls (user-interface elements) for interaction, command entry and command selection is provided

Note 1 to entry: Control information and/or controls (user-interface elements) for interaction, command entry and command selection may be positioned also to other parts of the display, e.g. the input/output area.

3.2.4
message area
area (3.2) where information such as status updates and/or other information e.g. is provided

Note 1 to entry: Information can include error messages, progress indication, feedback.

Note 2 to entry: Messages may be positioned also to other parts of the display, e.g. the input/output area.

3.3
code
technique for representing information by a system of alphanumeric characters, graphical symbols or visual techniques

Note 1 to entry: In general, alphanumeric codes are shorter than the full text needed to express the information content

Note 2 to entry: The term "code" is not to be confused with the terms "code" or "coding" in the computer science context, in which these terms refer to the instructions contained in an executable software program and the process of writing the instructions that comprise a software program.

Note 3 to entry: Visual techniques can include font, colour, highlighting.

3.3.1
mnemonic code
code (3.3) that is meaningful to the user and has some association with the words it represents

Note 1 to entry: Mnemonic codes frequently consist of alphanumeric characters, making them easier to learn and recall. Many mnemonic codes are abbreviations.

3.4
cursor
visual indication of where the user interaction via keyboard (or keyboard emulator) will occur

[SOURCE: ISO 9241-171:2008, 3.10]

3.5
field
user-interface element in which data is entered or presented

3.5.1
entry field
input field
field (3.5) in which users can input data or edit displayed data

3.5.2
read-only field
protected field
field (3.5) that contains data that cannot be modified by the user

3.6
focal colour
colour that is easily remembered and expressed by a short colour word (red, pink, yellow, blue, green, purple, orange, brown, grey, black, and white)

[SOURCE: ANSI HFES 200.5:2008, Clause 4, modified]

3.7
group
set of information items or user interface elements that are semantically related and perceptually distinct

[SOURCE: ISO 9241-112:2017, 3.14]

3.8
highlighting
display technique for emphasizing critical or important information and making it perceptually prominent

EXAMPLE Image polarity reversal, blinking, underscoring, use of colour, contrast enhancement (i.e. brightness coding), addition of graphics (e.g. draw a box around), size.

3.9
hue
attribute of a visual sensation according to which an *area* (3.2) appears to be similar to one of the perceived colours red, yellow, green or blue, or a combination of two of them

[SOURCE: ISO 9241-302:2008, 3.2.18]

3.10
icon
user interface symbol representing an object, action, and/or function

[SOURCE: ISO/IEC 11581-10:2010, 3.4, modified — Removal of the phrase "of the computer" and the Notes to entry.]

3.11
label
short, descriptive title for an entry or *read-only field* (3.5.2), table, control or other user-interface element

Note 1 to entry: In some applications, labels are classified as read-only fields.

Note 2 to entry: Labels include headings, field prompts, descriptive text (e.g. icon labels).

3.12
legibility
ability for unambiguous identification of single characters or symbols that may be presented in a non-contextual format

[SOURCE: ISO 9241-302:2008, 3.3.35]

3.13
list
horizontal or vertical sequential presentation of items in a display

Note 1 to entry: Items in a list can change according to the states of the application.

3.14
marker
symbol that is used for indicating a status or drawing attention to an item

EXAMPLE "*" is frequently used to indicate a required field.

3.15
pointer
graphical symbol that is moved on the screen according to manipulations or movements of a pointing device

Note 1 to entry: Users can interact with elements displayed on the screen by moving the pointer to that location and starting the interaction.

[SOURCE: ISO 9241-16:1999, 3.15]

3.16
saturation
chromaticness or colourfulness of an *area* (3.2) judged in proportion to its brightness

[SOURCE: ISO 9241-302:2008, 3.2.23]

3.17
spectrally extreme colour
extreme blue and extreme red

[SOURCE: ISO 9241-302:2008, 3.2.24, modified — Note to entry removed.]

3.18
table
orderly displayed data

Note 1 to entry: A table is often organized as a number of lists arranged in parallel columns or rectangular arrays, which are related to each other following a specific rule.

3.19
user-interface element
user-interface object
entity of the user interface that is presented to the user by the software

[SOURCE: ISO 9241-171:2008, 3.38, modified — Example and notes to entry removed.]

3.20
window
independently controllable region on the display screen, used to present objects and/or conduct a dialogue with a user

Note 1 to entry: A window is usually rectangular and delimited by a border.

3.20.1
primary window
window (3.20) that represents an operating system, an application, or an object

Note 1 to entry: It is possible to have more than one primary window presented at the same time.

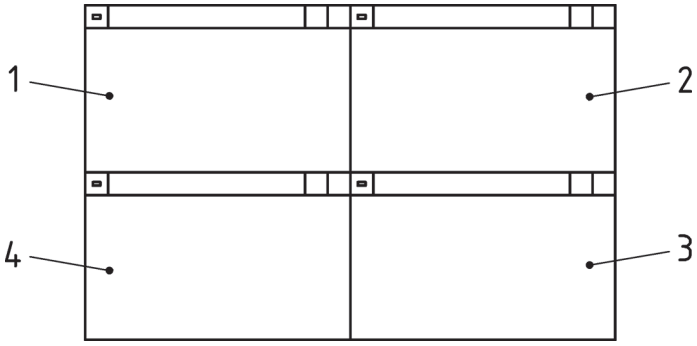
3.20.2
secondary window
window (3.20) arising out of user interaction with a *primary window* (3.20.1) displayed in the course of a dialogue

Note 1 to entry: A secondary window can also be a system initiated window.

3.21
windowing format
arrangement of multiple *windows* (3.20) which are displayed simultaneously

Note 1 to entry: There are several types of windowing formats such as tiled, overlapping, and mixed format.

3.21.1
tiled window format
side by side window format
format in which *windows* (3.20) are placed side by side and do not overlap

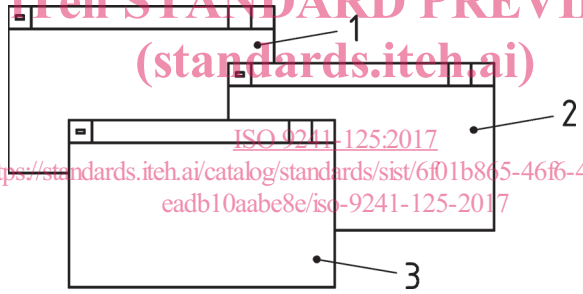


Key

1 window 1
2 window 2
3 window 3
4 window 4

Figure 2 — Illustration of a tiled window format

3.21.2
overlapping window format
format in which *windows* (3.20) partially or completely overlap each other



Key

1 window 1
2 window 2
3 window 3

Figure 3 — Illustration of an overlapping window format

3.21.3
mixed windowing format
format in which *tiled window formats* (3.21.1) and *overlapping window formats* (3.21.2) are combined

Note 1 to entry: The initial format can be tiled, but overlapping windows can be used to display transitory elements such as prompts and advisory messages.

4 Application of ISO 9241-125

4.1 Accessibility

Visual presentation of information shall be in accordance with ISO 9241-171, which gives specific requirements and recommendations for the presentation of information in the visual modality and the presentation of the same information in different modalities.

NOTE Conformity with ISO 9241-171 is achieved by satisfying all of its applicable requirements and by the provision of a systematic list stating how all of its applicable recommendations have been met (ISO 9241-171:2008, 7.2).

4.2 General guidance for presentation of information

The general principles provided by ISO 9241-112 should be applied to the presentation of visual information in the design of user interfaces. Each principle is accompanied by a non-exhaustive list of illustrative recommendations at various levels of detail. The principles are as follows.

— **Detectability**

Presented information is detectable if the information is presented so that it will be recognized as present.

— **Freedom from distraction**

Presented information is free from distractions if the information is presented so that required information will be perceived without other presented information interfering with its perception.

— **Discriminability**

Presented information is discriminable if the information is presented such that discrete items or groups of items can be accurately differentiated and if the items of information are presented in a manner that supports their association with or differentiation from other items or groups of items.

— **Interpretability**

Presented information is interpretable if it will be comprehended as intended.

— **Conciseness**

Information presentation is concise if only the necessary information is presented.

— **Consistency (internal and external)**

Presented information is consistent if items of information with similar intent are presented similarly and items of information with different intent are presented in different style and form within and across the interactive systems and the user's environment.

Guidance on *internal* consistency is related to the consistent use of conventions within the interactive system.

Guidance on *external* consistency is related to conventions known to the user from external sources.

4.3 Guidance on the presentation of visual information

Presentation of information in the visual modality should enable the user to perform tasks (e.g. search for information on the display) effectively, efficiently and with satisfaction.

The provisions for the presentation of visual information of this document support the general principles given in ISO 9241-112.