
**Ergonomics of human-system
interaction —**

**Part 161:
Guidance on visual user-interface
elements**

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*Ergonomie de l'interaction homme-système —
Partie 161: Éléments de l'interface utilisateur*
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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 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*.

ISO 9241 consists of the following parts, under the general title *Ergonomic requirements for office work with visual display terminals (VDTs)*:

- Part 1: General introduction
- Part 2: Guidance on task requirements
- Part 5: Workstation layout and postural requirements
- Part 6: Guidance on the work environment
- Part 11: Guidance on usability
- Part 12: Presentation of information
- Part 13: User guidance
- Part 14: Menu dialogues
- Part 15: Command dialogues
- Part 16: Direct manipulation dialogues

ISO 9241 also consists of the following parts, under the general title *Ergonomics of human-system interaction*:

- Part 20: Accessibility guidelines for information/communication technology (ICT) equipment and services
- Part 100: Introduction to standards related to software ergonomics [Technical Report]
- Part 110: Dialogue principles

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- Part 129: Guidance on software individualization
- Part 143: Forms
- Part 151: Guidance on World Wide Web user interfaces
- Part 154: Interactive voice response (IVR) applications
- Part 161: Guidance on visual user-interface elements
- Part 171: Guidance on software accessibility
- Part 210: Human-centred design for interactive systems
- Part 300: Introduction to electronic visual display requirements
- Part 302: Terminology for electronic visual displays
- Part 303: Requirements for electronic visual displays
- Part 304: User performance test methods for electronic visual displays
- Part 305: Optical laboratory test methods for electronic visual displays
- Part 306: Field assessment methods for electronic visual displays
- Part 307: Analysis and compliance test methods for electronic visual displays
- Part 308: Surface-conduction electron-emitter displays (SED) [Technical Report]
- Part 309: Organic light-emitting diode (OLED) displays [Technical Report]
- Part 310: Visibility, aesthetics and ergonomics of pixel defects [Technical Report]
- Part 331: Optical characteristics of autostereoscopic displays [Technical Report]
- Part 391: Requirements, analysis and compliance test methods for the reduction of photosensitive seizures
- Part 392: Ergonomic recommendations for the reduction of visual fatigue from stereoscopic images
- Part 400: Principles and requirements for physical input devices
- Part 410: Design criteria for physical input devices
- Part 411: Evaluation methods for the design of physical input devices [Technical Specification]
- Part 420: Selection of physical input devices
- Part 910: Framework for tactile and haptic interaction
- Part 920: Guidance on tactile and haptic interactions
- Part 940: Evaluation of tactile and haptic interactions
- Part 960: Framework and guidance for gesture interactions

Introduction



In different communities in the interactive system development ecosystem, the use, the names and the understanding of user-interface elements differs significantly. One of the results is that users have to cope with elements which differ in terms of keyboard entry and control, mouse behaviour, visual presentation of functionality and different options to control elements. **Consistent element behaviour, functionality and rendering is crucial for the usability of user interfaces.** This causes added efforts in all stakeholders in human-centred design activities, since this multitude needs to be managed in order to ensure high-quality collaboration of various specialists. Especially in the light of new emerging user-interface concepts and designs, a common definition of visual user-interface elements and the rationale for their selection, as well as their use can be regarded as an effort to sustain cooperation and ensure a sound basis for professional conversation. It is also of importance to state that this part of ISO 9241 of visual user-interface elements in no ways predetermines a visual style of the elements themselves, thus avoiding to impress determinants in creation, brand usage and style development. In addition, this part of ISO 9241 is laid out in an independent of platform specifics, so that no specific industrial user-interface styleguide, implementation technology or development process needs to be observed in order to be compliant with this part of ISO 9241.

This part of ISO 9241 aims to provide information on visual user-interface elements to help those responsible for managing software design and re-design processes, create user interface specifications, styleguides and visual concepts to identify, plan and design effective, efficient and satisfactory interactive systems.

Visual user-interface elements described in this part of ISO 9241 complements existing systems design approaches, methods or processes. They can be referenced in any kind of user interface strategy, regardless of the technology used for the user interface.

Table 1 — Overview of different visual user interface properties that are used to build a user interface design

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User Interface Design		
Interactive Properties		Informative Properties
		Decorative Properties

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Ergonomics of human-system interaction —

Part 161: Guidance on visual user-interface elements

1 Scope

This part of ISO 9241 describes visual user-interface elements presented by software and provides requirements and recommendations on when and how to use them. This part of ISO 9241 is concerned with software components of interactive systems to make human-system interaction usable as far as the basic interaction aspects are concerned.

This part of ISO 9241 provides a comprehensive list of *generic* visual user-interface elements, regardless of a specific input method, visualization, and platform or implementation technology. The guidance given in this part of ISO 9241 is intended to be used in conjunction with ISO 9241 guidance on dialogue techniques. It recognizes that additional elements can evolve. It also addresses *derivates*, *compositions* (assemblies) and *states* of user-interface elements. It gives requirements and recommendations on selection, usage and dependencies of user-interface elements and their application. It is applicable regardless of a fixed, portable or mobile interactive system.

It does not provide detailed coverage of the methods and techniques required for design of user-interface elements. This part of ISO 9241 does not address implementation (e.g. graphical design of elements) and interaction details for specific input methods or technologies. It does not cover decorative user-interface elements that are intended to address solely aesthetic (hedonic) qualities in the user interface, e.g. background images.

The information in this part of ISO 9241 is intended for use by those responsible for the selection and implementation of visual user-interface elements in interactive systems and for evaluating user interfaces. It is intended for use by those planning and managing platform specific aspects of user interface screen design. It also provides guidance for human factors/ergonomics and usability professionals involved in human-centred design. It addresses technical issues only to the extent necessary to allow users of this part of ISO 9241 to understand the relevance and importance of a consistent interface element usage and selection in the design process as a whole.

[Annex A](#) provides a guide to selection of different visual user interface elements depending of their appropriate application.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 9241-143:2012, *Ergonomics of human-system interaction — Part 143: Forms*

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.

**3.1
accessibility**

<interactive system>

usability of a product, service, environment or facility by people with the widest range of capabilities

Note 1 to entry: The concept of accessibility addresses the full range of user capabilities and is not limited to users who are formally recognized as having a disability.

Note 2 to entry: The usability-orientated concept of accessibility aims to achieve levels of effectiveness, efficiency and satisfaction that are as high as possible considering the specified context of use, while paying particular attention to the full range of capabilities within the user population.

[SOURCE: ISO 9241-171:2008]

**3.2
default action**

operation predefined for an object or set of objects (including an entire dialogue box) that will take place when the user actuates the default action mechanism

[SOURCE: ISO 9241-143:2012]

EXAMPLE In a search application, pressing the ENTER key activates the Search button.

**3.3
canvas**

area on the screen that is used to present or manipulate data, user-interface elements or to collect user input

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**3.4
click zone**

area in the user interface that is activated by input device

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**3.5
deactivation**

operation on a user-interface element that renders the object unable to receive user input that enters or changes data

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**3.6
dialogue**

interaction between a user and an interactive system as a sequence of user actions (inputs) and system responses (outputs) in order to achieve a goal

Note 1 to entry: User actions include not only entry of data but also navigational actions of the user.

Note 2 to entry: Dialogue refers to both the form (syntax) and the meaning (semantics) of interaction.

[SOURCE: ISO 9241-110:2006]

**3.7
form element**

user-interface element applicable to forms

[SOURCE: ISO 9241-143:2012]

**3.8
form**

structured display of fields and other user-interface elements that the user reads, fills in, selects entries for, or modifies

EXAMPLE Through choice buttons or radio buttons.

[SOURCE: ISO 9241-143:2012]

3.9**form structure**

organization and arrangement of information on individual and sets of forms, and the interconnections among forms for user navigation

[SOURCE: ISO 9241-143:2012]

3.10**hover area**

area of the user interface that is sensitive to an overlying pointer

Note 1 to entry: In touchscreen interfaces, often hover events are not used. Alternative means to signify the respective element are to be considered.

3.11**hover effect**

change of the user-interface element representation triggered by overlying pointer

3.12**list**

set of items

Note 1 to entry: A list can be sorted or unsorted, depending on the task.

3.13**navigation**

ability to move from one user-interface element to another within a user interface and to move throughout an interactive system

3.14**picker
selector
chooser**

user-interface element that provides means of selection of formatted data

Note 1 to entry: Examples of formatted data are colour values, dates, time.

3.15**pointing device**

device that translates a human controlling operation to a controlling operation on the display

Note 1 to entry: Depending on the applied technology, not only machine devices but also parts of the human body (e.g. fingers, arms) can currently be used as pointing devices.

Note 2 to entry: Pointing devices typically have buttons that are used to activate or manipulate user-interface elements.

Note 3 to entry: Almost any hardware can be used to control a pointer with the appropriate software.

[SOURCE: ISO 9241-16:1999]

3.16**state
status**

distinct condition of an object

[SOURCE: ISO 11064-5:2008]

3.17**touch area**

part of the user interface that is sensitive for touch events