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BSI Standards Publication

Ergonomics of human-system interaction

Part 143: Forms

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National foreword

This British Standard is the UK implementation of EN ISO 9241-143:2012. It supersedes BS EN ISO 9241-17:1998, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PH/9, Applied ergonomics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Foreword

This document (EN ISO 9241-143:2012) has been prepared by Technical Committee ISO/TC 159 "Ergonomics" in collaboration with Technical Committee CEN/TC 122 “Ergonomics” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.

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Endorsement notice

The text of ISO 9241-143:2012 has been approved by CEN as a EN ISO 9241-143:2012 without any modification.

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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.

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ISO 9241-143 was prepared by Technical Committee ISO/TC 159, *Ergonomics*, Subcommittee SC 4, *Ergonomics of human-system interaction.*

This first edition of ISO 9241-143 cancels and replaces ISO 9241-17:1998, of which it constitutes a technical revision.

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 4: Keyboard requirements*

— *Part 5: Workstation layout and postural requirements*

— *Part 6: Guidance on the work environment*

— *Part 9: Requirements for non-keyboard input devices*

— *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*

— *Part 17: Form filling dialogues*

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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*

— *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 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 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*

User-interface elements, human-centred design and evaluation methods, ergonomic requirements for the reduction of visual fatigue from stereoscopic images, and the evaluation of tactile and haptic interactions are to form the subjects of future parts 161, 230, 392 and 940.

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Introduction

This part of ISO 9241 is concerned with the ergonomic design of forms.

Forms, including dialogue boxes, are appropriate for data entry tasks requiring input or modification of multiple data items. Forms are used in various circumstances, including

— filling forms, such as income tax forms, registration (school, motor vehicle), and service order completion,

— entering information received over the telephone,

— interactively populating data in an application, such as database updates, consumer profiles and e-commerce transactions,

— specifying the application options and parameters (complex data retrieval requests, personalisation, system configurations settings), and

— responding to a mediate request for system information (e.g. using a dialogue box).

Forms can vary in content and complexity from a simple field to complex data entry that involves multiple data records. Forms are often based on a visual spatial metaphor but can be implemented in other modalities (e.g. voice user interfaces over the telephone).

Form users fill-in, select entries for, modify fields and/or use, the form to retrieve information from the system.

This part of ISO 9241 is aimed at

a) user-interface designers, who will apply it during the development process,

b) the designers of printed forms which serve as source documents,

c) buyers, who will reference it during the product procurement process,

d) evaluators responsible for ensuring products meeting its requirements and recommendations,

e) the designers of development tools to be used by interface designers, and

f) end users, who will gain from the potential benefits it provides.

This part of ISO 9241 provides requirements and recommendations concerning forms. Some of these are conditional with respect to whether they are relevant in terms of context of use variables such as particular kinds of users, tasks, environments or technology.

Designers using this part of ISO 9241 ought to be able to determine whether they are developing an interface that will meet those of the standard's requirements and recommendations that are applicable. Likewise, buyers and evaluators ought to have a means of determining how a product matches the applicable requirements and recommendations. It is not intended that every requirement and recommendation given in this part of ISO 9241 be applied, only those that are relevant. Annex B provides an example of a procedure for evaluating the applicability of, and conformance with, the requirements and recommendations.

The application of this part of ISO 9241 is expected to improve the overall quality of the form, but this International Standard (like any other standard) will not guarantee the quality of the interface. Quality depends on specific usability criteria as set by the user, buyer or other form consumer, which may include specifications based on this part of ISO 9241.

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ISO 9241-110 describes dialogue principles that are relevant for the design of forms. The principles provide the designer and evaluator with additional information concerning the ergonomic rationale for the various recommendations given in this part of ISO 9241 and, therefore, assist in making trade-offs. However, it is often necessary to base trade-offs on other considerations as well.

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Ergonomics of human-system interaction —

Part 143:
Forms

1 Scope

This part of ISO 9241 provides requirements and recommendations for the design and evaluation of forms — in which the user fills-in, selects entries for, or modifies labelled fields on, a “form” or dialogue box presented by the system. Often the system then creates or updates the data associated with the form. Form-based entries typically are in the form of typed input (abbreviations, or full names) or selections from available option lists.

This part of ISO 9241 is applicable to forms regardless of the modality in which they are rendered (visual, spatial, vocal). However, much of the guidance is based on a model of visual and spatial relationship.

In addition, this part of ISO 9241 specifies the use of non-text methods for providing forms entries (e.g. list boxes) and pertains to dialogue boxes which utilize form techniques. Guidance is provided on the selection and design of those user-interface elements relevant to forms.

While lists used to enter forms data are covered in this part of ISO 9241, menus which are similar to lists are outside its scope but are covered in ISO 9241-14. Neither is this part of ISO 9241 applicable to the hardware aspects of forms.

NOTE Some of the requirements and recommendations in this part of ISO 9241 are based on Western Language conventions. For other languages, particular requirements or recommendations might need to be modified to fit the readability and/or text input considerations inherent in these languages.

The requirements and recommendations in this part of ISO 9241 are applicable throughout the development process — for example, as guidance for designers during design, as a basis for heuristic evaluation, as guidance for usability testing — and in the procurement process.

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 9241-12:1998, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 12: Presentation of information*

ISO 9241-16, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 16: Direct manipulation dialogues*

ISO 9241-171:2008, *Ergonomics of human-system interaction — Part 171: Guidance on software accessibility*

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3 Terms and definitions

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

3.1
analogue form element
user-interface element that allows the user to select a value within a continuous range

EXAMPLE Rotary dials, slider.

3.2
check box
check button
user-interface element used to select an option that can be either {“on” or “off”} or {“yes” or “no”} with a label (usually text) that indicates what the option is and an indicator (e.g. graphic checkmark within the individual check box) that indicates whether or not the option is selected

NOTE 1 Check boxes in a group are independent, i.e. selecting one option does not affect the selection of other options in that check box group. In a group of check boxes, one or many of them can be checked at the same time.

NOTE 2 Contrast with **radio button** (3.20).

3.3
combination box
combo box
user-interface element that combines a text field with a list box and allows the user to type input into a text field or to select an option from a list box, which will fill in the text field

NOTE 1 A combination box typically has a label (textual or graphical) that indicates the purpose of the combination box.

NOTE 2 Contrast with **list box** (3.15).

3.4
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

3.5
dialogue box
subordinate form (typically presented in a separate window) that supplements and/or supports the interaction that is taking place in the main application dialogue

NOTE If a message requires user input it could be considered a dialogue box.

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 User actions include not only entry of data but also navigational actions of the user.

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

[ISO 9241-110:2006]

3.7
entry field
input field
field in which users can input data or edit displayed data

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NOTE 1 Entry fields can be optional or mandatory (required) fields for the user.

NOTE 2 Content can be prepopulated with a default value relevant to the task.

NOTE 3 Data in entry fields could be numerical, textual, alphanumerical, etc.; see also **text field** (3.29) and ISO 9241-12:1998, 3.5.

[ISO 9241-12:1998, 3.5.1]

3.8
field
user-interface element in which data is entered or presented

NOTE Adapted from ISO 9241-12:1998.

3.9
form
structured display of fields and other user-interface elements that the user reads, fills in, selects entries for (e.g. through check boxes or radio buttons) or modifies

3.10
form element
user-interface element applicable to forms

3.11
form structure
organization and arrangement of information on individual and sets of forms, and the interconnections among forms for user navigation

3.12
hierarchical list
series of lists which are structured in a hierarchical or “tree-like” manner, where the selection of the initial item leads to another list containing additional items which can lead to another list, etc., until the desired item is located

3.13
implicit designator
portion of an option name or control label used for keyboard selection

[ISO 9241-171:2008, 3.16]

3.14
label
short descriptive title for an entry or read-only field, table, control or other user-interface element

NOTE 1 In some applications, labels are classified as protected fields.

NOTE 2 Adapted from ISO 9241-12:1998, 3.9.

3.15
list box
user-interface element that provides a presentation (usually vertical) of items from which the user can select only one (single selection) or more than one (multiple selection)

NOTE 1 The items in the list can be represented by a text and/or graphic label.

NOTE 2 One particular instance is the drop-down list box. When a drop-down list is inactive, it displays a single value. When activated, it displays (drops down) a list of values, from which the user can select one. When the user selects a new value, the user-interface element reverts to its inactive state, displaying the selected value.

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3.16
list button
user-interface element used to access a list whereby when the button is activated, a pop-up list of items is displayed

NOTE The list button contains the name of the currently selected list item and has a graphic (usually a bar) indicating that additional selections are available.

3.17
name
word or phrase associated with a user-interface element and that is used to identify the element to the user

[ISO 9241-171:2008]

3.18
navigation
⟨forms⟩ ability to move from one user-interface element to another within a form, to move throughout a form and to move from form to form

3.19
push button
command button
user-interface element used for executing an immediate command or action

NOTE A push button typically contains a label, which can be textual and/or graphical.

3.20
radio button
user-interface element used to select an option from a group of mutually exclusive options, which has a (usually text) label that indicates what the option is and an indicator (e.g. graphic dot) that indicates whether or not the option is set

NOTE 1 Radio buttons exist in groups used for a “one of many” choice, where exactly one option in the group can be selected at any time, and selecting one results in the de-selection of any different previously selected option.

NOTE 2 Contrast with **check box** (3.2).

3.21
read only field
protected field
field that contains data that cannot be modified by the user

NOTE Adapted from 9241-12:1998, 3.5.2.

3.22
scroll bar
user-interface element that allows a user to view objects that extend beyond the size of a displayed related window or list by moving them into or out of the available display area

NOTE 1 A scroll bar for an area indicates whether or not additional information is available and can also indicate the relative position of the displayed part of the information.

NOTE 2 Adapted from 9241-16:1999, 3.19.

3.23
scroll box
elevator
thumb
user-interface element in the shape of a rectangle within a scroll bar that allows the user to move to a specific region of a displayed file by dragging the rectangle to the appropriate location within the scrollbar (shaft)

NOTE The length of the scroll box typically denotes the relative amount of material in the file (e.g. form).

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3.24
selection cursor
indicator of an item whose selection state can be changed by a defined confirming action

3.25
selection indication
visual or other cue that indicates the selected element on the display, to which the user can apply a subsequent action

[ISO 9241-16:1999, 3.21]

3.26
selection list
choice list
user-interface elements presented as a list containing a number of items from which a user can select

NOTE 1 Single selection or multiple selection can be possible. The number of items can be fixed or can change during the dialogue.

NOTE 2 Selection lists are often presented in a box, i.e. list box 3.15.

3.27
stepper
user-interface element that allows the user to move through the available alternatives, options or values, one at a time

NOTE 1 A stepper typically has an area that displays the current value and one or two graphical elements that allow the user to move through the options.

NOTE 2 Steppers can be combined with data entry fields.

NOTE 3 There are various types of stepper elements including spin buttons, cycle buttons, little arrows and sliders.

3.28
tab set
user-interface element that uses a metaphor of a set of index cards with tabs to identify them

NOTE Each tab in a tab set has an associated set of displayed information and/or controls. Selection of a different tab within the tab set allows users to move among the various sets of information and options.

3.29
text field
user-interface element that allows the user to enter character based data

NOTE A label can be used to indicate the type of information to be provided in the field.

3.30
toggle button
user-interface element that provides a choice between two states

NOTE A toggle button's two states, set and unset, are typically shown by its appearing “pushed in” or “popped out” respectively.

3.31
user-interface element
user-interface object
entity of the user interface that is presented to the user by the software

EXAMPLE Text, graphic, control.

NOTE 1 User-interface elements can be interactive or not.

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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 such things as basic objects (such as window title bars, menu items, push buttons, image maps, and editable text fields) or 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 such things as menus, menu items, messages, and action prompts.

[ISO 9241-171:2008, 3.38]

4 Forms

4.1 Selection

Forms, including dialogue boxes, should be used for structured data entry tasks requiring input or modification of multiple data items.

A major use of forms is in entering information into forms displayed on a computer. Also, forms are often used for data entry into a computer from a paper source document. Examples include income tax forms, registration (school, motor vehicle) and service order completion. Another use of forms is for entering information received over the telephone.

Dialogue boxes are commonly used for specifying application options and parameters. Also, dialogue boxes are often appropriate for certain complex data retrieval requests where the user might find it easier to fill in parameter information than to input the parameters via a command language.

Interface design depends upon the task, the user, the environment and the available technology. Consequently, this part of ISO 9241 cannot be applied without knowledge of the design and use context of the interface and it is not intended to be used as a prescriptive set of rules to be applied in their entirety (see ISO 9241-11 and ISO 9241-210). Rather, it assumes that the designer has proper information available concerning task and user requirements and understands the use of available technology (this may require consultation with a qualified ergonomics professional as well as empirical testing with real users).

4.2 General requirements and recommendations

4.2.1 Form titles

Forms shall be titled unless a title would be redundant (e.g. if it is provided by the surrounding user interface). Any title shall clearly indicate the purpose of the form and differentiate it from other forms.

NOTE 1 In visually displayed forms, titles are usually placed at the top of the form (or page in the case of a web-based application).

NOTE 2 In window-based interfaces, the title of a form can be the window title, if the form is the only content of the window.

NOTE 3 Forms are typically embedded in larger user interfaces, such as applications.

4.2.2 Relationship of form title to application structure

The title should provide the user with a sense of the location of the form within the application structure.

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4.2.3 Visual coding

If the task requires, or is enhanced by, discrimination between user entries, defaults and previously entered data, and the form is presented visually, distinctively different visual coding should be used.

Distinctively different visual coding shall not be limited to colour (see ISO 9241-171:2008, 10.4.1).

4.2.4 Appearance of form elements

If elements have different states, the current state of the element shall be clearly indicated by a perceptible cue.

EXAMPLE 1 Inactive elements are dimmed.

EXAMPLE 2 In voice-based interaction, unavailable elements might not be presented but still be responded to by the system to tell the user that the option is inactive.

EXAMPLE 3 A check box has a check or tick in it to show it has been selected.

NOTE See ISO 9241-171:2008, 8.5.4, on providing information on a state to assistive technology.

4.2.5 Form display density

Unless required by the task or context of use, forms should limit the density of the textual information displayed.

NOTE For character density within forms, the limit of 40 % overall density, based on a percentage of the total available form space filled, is appropriate (see ISO 9241-12:1998, 5.4.2).

4.2.6 Complexity

Complexity in dialogue boxes and forms should be appropriate for the task. If a dialogue box or form supports basic functionality, as well as advanced, auxiliary or less frequently used functionality, it should use one of the following to reduce the complexity:

a) an expandable form to present the advanced, auxiliary or less frequently used functionality;

b) additional forms or dialogue boxes with advanced, auxiliary or less frequently used functions, accessible via controls within the higher level dialogue box or form;

c) a multiple-page dialogue box, with advanced, auxiliary or less frequently used functions on later pages (e.g. tabbed dialogues, scrollable dialogues).

4.2.7 Restricting use of expanded dialogues

Dialogue box expansions and additional dialogues should be restricted to functions that are needed only by a subset of users or that are not needed for the typical execution of a task.

4.2.8 Instructions

Access to instructions should be provided.

NOTE 1 Instructions are particularly important for helping the user to navigate through, complete, save and transmit the form.

NOTE 2 Instructions are helpful for infrequent users and users unfamiliar with the form.

NOTE 3 A list at the beginning of the form as to the information required to complete the form is particularly useful for blind or elderly users.

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NOTE 4 Instructions are helpful for any user-interface element that the user might be unfamiliar with.

NOTE 5 It is preferable to place instructions where they can most easily be used (see ISO 9241-13), without their getting in the way of completion of the task when not needed.

4.2.9 Help

If the user of the form needs further information on how to complete an entry in the form, access to completion assistance or Help should be provided.

EXAMPLE 1 When the user puts the cursor on the entry field, a pop-up message containing context-sensitive help is provided.

EXAMPLE 2 The user clicks on a Help button to obtain specific guidance for completing the entry in the form.

NOTE Completion assistance is particularly helpful for blind or elderly users and non-native language speakers.

4.2.10 Overview of structure

If beneficial to task performance and if the form structure is complex, an overview of the form structure or a visual presentation of the structure should be provided to the user.

EXAMPLE A flow diagram showing the form's structural components is provided upon request by the user.

4.2.11 Use of modal and modeless dialogue boxes

Unless it is necessary for command completion, or if important to prevent further interaction until a condition is satisfied, modeless rather than modal dialogue boxes should be used.

NOTE 1 In modal dialogue boxes, the user completes the dialogue and closes it before continuing with the application. These dialog boxes are best used for critical or infrequent, one-off tasks that require completion before continuing.

NOTE 2 In modeless dialogue boxes, the user is able to switch between the dialog box and the application as desired. These dialog boxes are best used for frequent, repetitive, on-going tasks.

EXAMPLE 1 A modeless dialogue is used to allow the user to set preferences. This dialogue allows the user to navigate within the application to determine the impact of the settings as they are made.

EXAMPLE 2 A modal dialogue is presented to prompt the user to save data that would otherwise be lost when the user is closing a window.

4.2.12 Accessibility

Forms, dialogue boxes and their elements shall be in accordance with ISO 9241-171.

NOTE Conformity with ISO 9241-171 implies that every applicable requirement and every applicable recommendation is met. See ISO 9241-171:2008, 7.2 for details.

4.2.13 Consistency

Behaviour (conceptual, semantic and lexical) of forms should be consistent through platforms and systems (e.g. for mobility… PCs, PDAs, Kiosks), wherever possible.

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5 Information presentation

5.1 General

ISO 9241-12 shall be consulted for general guidance on information presentation concerning forms.

NOTE Many of the recommendations in Clause 5 are intended for forms presented in the visual modality and are based on left-to-right writing.

5.2 Layout

5.2.1 Paper document source

If a paper document is used as the source for computer input and the form is to be presented visually, the forms screen should be designed to be consistent with the structure of the paper source document in terms of item ordering, grouping, units for input values (e.g. millimetres or metres).

NOTE Compatibility with paper source documents is an important layout consideration. However, if the layout of the paper source document is not compatible with efficient task performance, redesign of the source document is worthy of consideration. If there are conflicting requirements between those filling in the paper forms (e.g. customers) and those filling in the computer forms, it can be more important to ensure those filling in the paper forms achieve the highest efficiency at the expense of the computer input.

5.2.2 No source document

If forms do not depend upon a source document, the following is recommended.

a) The arrangement of user-interface elements in the dialogue should be based on the sequence that is appropriate for the written language of the user who will use the dialogue.

   EXAMPLE 1 For an English-based dialogue, the elements are arranged from left to right and top to bottom.

b) Entry fields should be grouped by, e.g. function or importance, or optimized based on input sequences from the user's point of view.

   EXAMPLE 2 In a telephone sales transaction, the form is dynamically modified on the basis of customer choices to guide the sales person in completing the transaction.

   NOTE 1 If data is supplied by a customer, the sequence can depend on customer needs.

   NOTE 2 See ISO 9241-12:1998, 5.6 for guidance on grouping.

5.2.3 Order of required fields and optional fields

If the form contains both required fields and optional fields within a functional or logical grouping of fields, required fields should be positioned first, unless such positioning is inappropriate to the user's task (e.g. it would not be consistent with a paper source document).

NOTE If users include the elderly, separating required and optional fields is particularly important, since elderly users often do not recognize coding typically used (e.g. the asterisk) for required fields.

5.2.4 Alphanumeric field alignment

If the form is presented visually and if appropriate to the language context, alphanumeric entry fields should be aligned vertically in one or more columns and left-justified within each column.

NOTE This will improve visual scanning and often minimizes the keystrokes required to move between fields.

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5.2.5 Numerical field alignment

If the form is presented visually and if groups of entry fields are all numeric and field lengths are different, the content of the fields should be displayed right-justified. If numerical fields contain decimal markers, they should be aligned to the decimal marker.

5.2.6 Allowable field values

Information should be provided indicating allowable field values (i.e. either display the information on the form or on demand).

5.3 Names and labels

5.3.1 Consistency

Naming of labels should be consistent through different platforms and systems (e.g. for mobility… PCs, PDAs, Kiosks).

5.3.2 Naming elements and groups of elements

All elements and groups of elements shall have a name, whether or not the label is visually displayed (see ISO 9241-171:2008, 8.1).

NOTE 1 Names can be utilized by a screen reader even if the corresponding label is not displayed.

NOTE 2 In many cases, both are handled as attribute (or property) of user-interface element.

5.3.3 Label visual design

ISO 9241-12:1998, 5.9, shall be consulted for general guidance on visual design of labels.

5.3.4 Differing label lengths

If text or alphanumeric fields are aligned vertically in columns, label lengths could differ significantly and the task involves sequential data entry, labels should be right-justified and fields should be left-justified, or the fields should be left-justified and the labels placed above the fields and left-justified with the fields.

NOTE 1 Significant differences can be defined as a condition in which the horizontal dimension of the longest label is twice that of the shortest label

EXAMPLE 1 In Figure 1, the field labels differ significantly and the labels are right justified.

Name: [ ]

Age: [ ]

Employee number: [ ]

Figure 1 — Differing label lengths with labels to the left of the entry

EXAMPLE 2 In Figure 2, the field labels differ significantly and the labels are placed above the fields.

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Name:

Age:

Employee number:

Figure 2 — Differing label lengths with labels above entries

NOTE 2 Generally, top-positioned labels work well for short forms that are familiar to the user.

5.3.5 Similar label lengths

If text or alphanumeric fields are aligned vertically in columns and field label lengths do not differ significantly, field labels and fields both may be left-justified.

EXAMPLE Since “Name” and “Age” do not differ significantly in length, the labels are left-justified, see Figure 3.

Name:

Age:

Figure 3 — Labels and fields left justified

NOTE It is important to consider that the space at magnification levels can be significantly larger than at the normal viewing level.

5.3.6 Label placement for search tasks

If the user's task involves searching a group of labels for a particular label, then field labels should be left-justified.

5.3.7 Consistent label positions

Labels should be consistently positioned for the type of user-interface element or group of elements within a given context.

5.3.8 Label position for check boxes or radio buttons

Labels for check boxes or radio buttons should be consistently located to the right, unless the button is large enough for the text to be located inside the button.

5.3.9 Labels for screen reader use

If the label name is to be read by a screen reader, the individual check box or radio button label name should include the label name of the group.

NOTE See ISO 9241-171 for accessibility issues concerning names and labels.

5.3.10 Groups of fields

If fields are grouped, the label of the group should be placed at the top of the group.

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5.3.11 Multiple instances of fields in a matrix

If a label is used for multiple instances of fields in a matrix (e.g. table), the label should be located above the column (see Example 1) or to the left of the row (see Example 2).

EXAMPLE 1 In Figure 4, the labels, “Last Name”, “First Name” and “Age in Years” are displayed above the columns.

Last Name	First Name	Age in Years
Williams	Peter	35
Collins	Robert	41
Robertson	William	26
Hofmann	David	32

Figure 4 — Labels located above columns

EXAMPLE 2 In Figure 5, the labels, “Last Name”, “First Name” and “Age in Years” are displayed to the left of the rows.

Last Name	Williams	Collins	Robertson	Hofmann
First Name	Peter	Robert	William	David
Age in Years	35	41	26	32

Figure 5 — Labels located to the left of rows

5.3.12 Descriptive field labels

All fields should be clearly and unambiguously labelled to describe the purpose or function of content of each.

5.3.13 Distinctive field labels

Distinctive words and/or codes (e.g. position, border, font, colour) should be used for entry field labels, and the approach used should be applied consistently throughout the form so that entry fields will not be confused with data, instructions, etc.

NOTE See ISO 9241-12 and ISO 9241-171 for guidance on limiting the exclusive use of colour.

5.3.14 Consistent labels

The mapping between the labels and functions for form elements should be consistent across a software application product or service.

EXAMPLE Table 1 depicts the element label/functionality of the “OK”, “Apply” and “Cancel buttons".

Table 1 — Element label/functionality

Element label	Functionality
OK	Applies any changes made to the elements in the dialogue box and dismisses the dialogue box.
Apply	Applies any changes made to the elements in the dialogue box and leaves the dialogue box up (i.e. does not dismiss the dialogue box).
Cancel	Dismisses the dialogue box without performing any changes that have not yet been applied.

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5.3.15 Symbols or units

Symbols or units ($, f, %, mph, cm, l, etc.) should be displayed as additional labels when required by the user for interpretation of the data in an entry field, see ISO 9241-12:1998, 5.9.7.

NOTE The symbol or unit can be added to the column label in the case of a column of fields.

5.3.16 Initial upper-case letter for field labels

To facilitate readability, text field labels in English should begin with an upper-case letter. The rest of the label should contain lower-case (small) letters, except for instances where the label is a logo, an acronym, a numeric value, or language convention requires each word in the label to begin with a capital letter.

NOTE For languages other than English other rules of writing can apply. For example, in German all nouns begin with an upper-case letter.

5.3.17 Implicit designator for elements

To facilitate user navigation within the form or dialogue box, an implicit designator should be assigned to the label of each element.

NOTE Since each check box in a group represents a separate element, an implicit designator would need to be assigned for each check box in a group of check boxes.

5.3.18 Multiple pages

5.3.18.1 In a sequence of multiple forms, the location within the sequence shall be provided and placed at the same location on each form.

EXAMPLE 1 "Page 1 of 3" is positioned close to the title at the top of the form.

EXAMPLE 2 The list of forms is presented and the current form is highlighted in this list.

5.3.18.2 If the form is columnar, the labels of the columns should be redisplayed.

5.4 Visual cues in fields and forms elements

5.4.1 Design considerations

Cueing should be provided appropriate to the modality of presentation.

NOTE The recommendations concerning visual cues in fields and form elements are intended for forms presented in the visual modality.

EXAMPLE Grouping fields by distance/spacing provide the cue that they belong to each other in a visual or tactile modality. Auditory modality use pauses for different groups.

5.4.2 Fields with fixed length entry

If the text entry fields are of fixed length, lengths should be explicit (see ISO 9241-12:1998, 5.10.4).

EXAMPLE Character spaces are shown, separated by boxes to depict the exact length of the field as shown in Figure 6.

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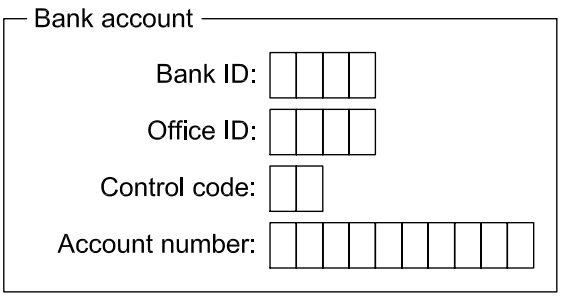

Figure 6 — Fixed length entry fields explicitly shown

NOTE Lengthy and/or complex groups of characters could be broken up into significant elements, possibly labelled accordingly.

5.4.3 Fields with maximum length

If the text entry fields have a maximum length, this should be explicit.

EXAMPLE 1 The maximum length is shown by the amount of space in the field.

EXAMPLE 2 A long field is accompanied by an indicator of maximum number of characters available.

5.4.4 Representation of optional and required entries

Required and optional entry fields shall be represented so that the differences between them are perceptible.

EXAMPLE 1 An asterisk is placed to the left of the label of required entry fields (making this information also available to blind users via speech output). In addition, a border with a heavier line thickness is placed around required entry fields to distinguish them from optional entry fields.

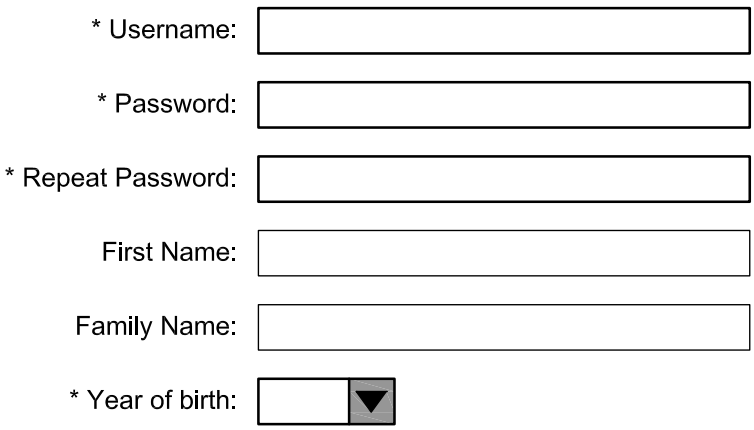

Figure 7 — Representation of required and optional entry fields

EXAMPLE 2 Underscores are used for required entries and periods for optional entries.

EXAMPLE 3 Different colours or shades are used to distinguish required and optional fields, with colours that are distinguishable on a monochrome display.

NOTE See ISO 9241-12 and ISO 9241-171 for guidance on limiting the exclusive use of colour.

5.4.5 Inform on representation used to distinguish between required and optional entries

Information on the representation used to distinguish between required and optional entry fields should be available to the user.

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5.4.6 Modifiable versus non-modifiable fields

The user should be able to distinguish easily between fields that can be modified and those that cannot (“read-only” fields) by appropriate coding (see ISO 9241-12).

EXAMPLE 1 Non-modifiable fields have the same background colour as the background of the dialogue box, whereas modifiable (read-write) fields use a different colouring.

EXAMPLE 2 Read-only fields take focus in order for the contents to be read and so that they can be announced as read-only by screen readers.

5.4.7 Cues for entry format

Cues for data entry format (e.g. for time duration “hh:mm:ss”) should be displayed within the entry field or in field labels. If abbreviated values are used, it should be clear to the user what the abbreviations mean (e.g. Y/N, for Yes or No).

NOTE See ISO 9241-12:1998, 5.10.3.

5.4.8 Cues for push buttons

Push buttons should have visual cues that indicate whether the command will be carried out immediately or the user will need to provide additional input or confirmation before the command is carried out.

EXAMPLE Push-button labels that will lead to another dialogue or message box before the command is carried out are followed by an ellipsis ("..."), while push-button labels for commands that will be carried out immediately do not have this cue.

5.4.9 Cues for expanding dialogues

If a form element is provided to allow the user to expand a dialogue box or form to reveal additional functionality, the element should contain a visual cue or label indicating that the dialogue box or form will be expanded.

EXAMPLE A push button with a symbol and a label (e.g. Advanced >>) is used to access the hidden portion of a dialogue.

5.4.10 Cues for contracting dialogues

If a form element is provided to allow the user to contract a dialogue box or form in order to hide functionality, the element should contain a visual cue or label indicating that the dialogue box or form will be contracted.

EXAMPLE A push button with a symbol and a label (<< Basic) is used to hide the optional portion of the dialogue.

It is important that the user be able to easily contract the dialogue again after expanding it.

6 Interaction

6.1 Navigation

6.1.1 Method

The user will need navigation methods to access the areas of the form that are required by their tasks. The choice of a navigation method should take into account the particular user population and compatibility with the user's flow of work.

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6.1.2 Movements among fields

The user shall be provided with the capability to move from field to field within a group and, if appropriate, to move to nonadjacent fields in other groups.

NOTE 1 A tab key, cursor keys and/or pointing device can be used to move between fields.

NOTE 2 ISO 9241-171:2008, 9.3.2, and ISO 9241-171:2008, 9.3.14, give requirements for keyboard-only navigation and activation.

6.1.3 Quick access

If rapid access to a specific field in the form is required, a quick access mechanism should be provided.

EXAMPLE 1 Fields have implicit designators and the users are able to go to the field by typing in the designator.

EXAMPLE 2 The user presses a designated function key and then types in the label or number in a dialogue box.

6.1.4 Return to initial field

If appropriate to the task, a key or command should be provided so that the user can return to the initial field on the form.

6.1.5 Record cycling

If the data is organized in sequential records and a form represents a view of data from one record, a mechanism should be provided for cycling from record to record, forwards and backwards.

6.1.6 Pointing device and multiple forms

If a pointing device is used for input and the task involves multiple forms, a mechanism for navigating between forms using the pointing device should be provided.

6.1.7 Conditional navigation

If the value of a particular entry makes some of the entries following it unnecessary, the system should move to the next appropriate entry field after the entry is completed or upon tabbing.

Where possible, entry fields that are no longer required should be deleted or protected.

It is important for the user to recognise which fields currently do not require entries based on a previous entry.

6.2 Navigation by tab keys and scrolling

6.2.1 Tab keys or equivalents

A tab key, or equivalent, should be provided for moving from field to field.

NOTE Not every computing device has a tab key for moving from field to field, but in many cases there is another key or command that fulfils the same function. The term “tab key” is used to represent either a real tab key or as the equivalent of a tab key.

6.2.2 Completely filled-in fixed-length fields

If all of the fields on the form are to be completely filled in and the forms are easily learned, auto-skip tabbing from field to field should be provided (i.e. the cursor automatically skips to the next field when the last character position in the field is filled).

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Auto-skipping should be used only for data entry tasks when it is consistent with user expectations, when it does not repeatedly create errors or delays, and when reverse tabbing is provided for correcting errors.

6.2.3 Mutually exclusive fields

If mutually exclusive fields are present on the form, skipping remaining choices should be allowed when an entry has been made for one of the choices in the field.

6.2.4 Form sections

If the form is organized into meaningful information groups (sections), the user should be provided with the capability to move from group to group, i.e. the user should not have to tab through all of the fields in a group in order to move to the next group.

6.2.5 Backwards tabbing

If a form or dialogue box supports tab key navigation, a mechanism for tabbing backwards through fields should be provided.

6.2.6 Forward wrapping

When pressed in the last field, the forward tab navigation key should move to the first field in the form or dialogue box.

6.2.7 Backward wrapping

When pressed in the first field, the backward tab navigation key should move to the last field in the form or dialogue box.

6.2.8 Field scrolling

If the maximum length of the data to be presented in a displayed field is longer than the field, a scrolling mechanism should be provided.

Consider providing auto wrap capability for text entry only.

6.2.9 Scrolling by pages

When scrolling by page, there should be a minimum of one unit of overlap between the information that is presented.

EXAMPLE Pages on the form are scrolled by using the up or down double arrows in the form's vertical scroll bar.

NOTE The overlap between one page and the next yields visual continuity for the user.

6.3 Input focus and cursors

6.3.1 Keyboard focus

Only one field at a time within the form or dialogue box shall have keyboard focus for a given user.

NOTE A field will have keyboard focus only when the window, form or dialogue box containing it has keyboard focus.

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6.3.2 Cues for keyboard focus

6.3.2.1 The field with keyboard focus should be indicated by the presence of a focus indicator.

6.3.2.2 When a text field no longer has keyboard focus, it should not display a text cursor.

6.3.3 Initial focus position

When the dialogue box or form is first displayed, it should have keyboard focus and the focus indicator should be positioned automatically at the first entry field that must or may be completed by the user.

6.3.4 Initial placement of the text cursor

The location of the text cursor when a text field is first given keyboard focus should support the user's task.

a) If the task flow indicates that a portion of the text field is likely to be modified, then the text cursor should be placed at the end of that portion.

EXAMPLE A server and its fully distinguished name are displayed in a text field. The text cursor is placed at the end of the hostname, before the domain name, as this is the portion of the name most likely to be changed.

b) If the task flow indicates that no specific portion of the text is likely to be modified, the text cursor should be placed at the end of the text in the field.

NOTE If the entire text is selected for replacement it is possible that the text cursor will not be shown, see 6.3.5.

6.3.5 Replacement of text in a field

If the user's task will typically require the replacement of all rather than a portion of the text in a field, the entire text should be selected for replacement when the user first enters that field:

a) if the user enters information into the field, the previously selected text should be replaced with the new text;

b) if the user leaves the field without entering new information, the text that was initially in the field should remain in the field;

c) a mechanism should be provided for positioning the text cursor within the field so that information can be entered without deletion of the previous text, in case the user wants to modify the existing text.

EXAMPLE The user can remove the replacement highlight and position the text cursor by using the arrow keys or clicking within the text field with the pointing device.

6.3.6 Indirect regaining of keyboard focus

If a field has lost keyboard focus and subsequently regains the focus indirectly due to the form or dialogue box regaining focus:

a) if the field is a text field, the text cursor should reappear at the same position it had when the field lost keyboard focus;

b) if the field is not a text field (e.g. a radio button group), the selection indicator(s) and/or selection cursor should reappear at the same position as when the field lost keyboard focus.

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6.3.7 Regaining focus by clicking in a field

If a field has lost keyboard focus and subsequently regains the initial focus by a click within the element:

a) if the element is a text field, the focus indicator should move to the field and the text cursor should move to the position in the field where the click occurred;

b) if the element is a check box or a radio button, the focus indicator should move to the specific button clicked and the state of that button should change;

c) if the element is a push button, that push button should be activated, and keyboard focus should change based on the action defined for the push button;

d) if the element is a list box, the focus indicator should move to the list box and the selection indicator should be shown on the item at the position where the click occurred.

EXAMPLE 1 Activation of a push button that results in a new dialogue box moves keyboard focus to the new dialogue box.

EXAMPLE 2 Activation of a push button that is part of a combination box causes a list to be displayed and keyboard focus moves to the first focusable item in the list.

6.3.8 Indicators and cursor for multiple selection

When a multiple-selection list box is entered, the selection cursor should be on the first item in the list box. There should be a selection indicator for each item in the list box that is currently selected.

EXAMPLE 1 In Figure 8, the selection cursor is on “Family”, while “Friends” and “Travels” are shown as currently selected items by the checks in the check boxes.

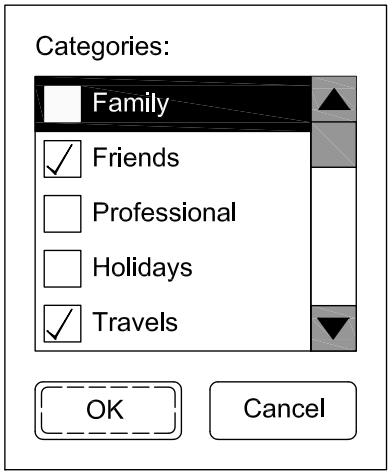

Figure 8 — Selection cursor and selection indication for check boxes

EXAMPLE 2 In Figure 9, the selection cursor is on “Family”, while “Friends” and “Travels” are shown as currently selected items by highlighting.

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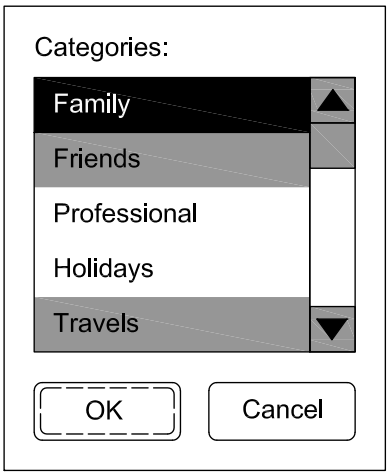

Figure 9 — Selection cursor and selection indication for a list

6.3.9 Indicator for single selection

When a single selection list box initially receives focus, the presence and location of the selection indicator should support the user's task:

a) the selection indicator should be on the current selection or the default selection in the list box — see the recommendation given in 8.9 for selections in a single-selection list box;

b) if there is no current selection and a default selection is inappropriate to the task, no selection indicator should be present; nevertheless, the selection cursor should be on the first item in the list to allow keyboard navigation.

EXAMPLE Figure 10 contains a selection indicator with a default selection. Figure 11 contains a selection cursor but does not have a currently active selection.

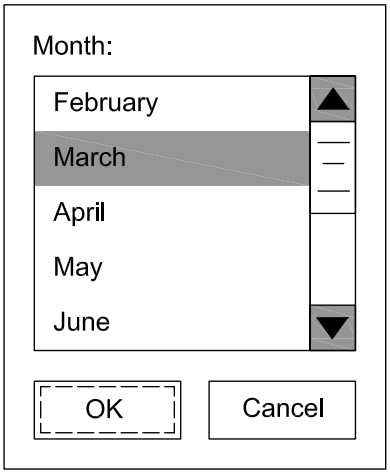

Figure 10 — Default selection

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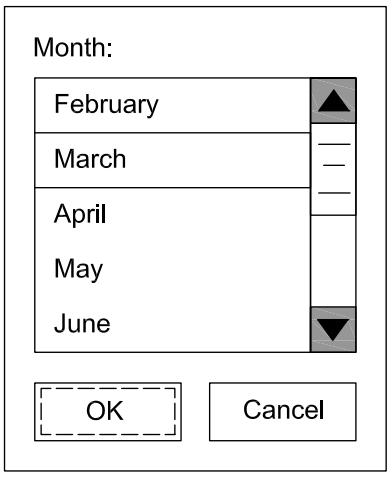

Figure 11 — Selection indicator without a default selection

6.4 Input

6.4.1 Considerations

User input considerations should include

— user control of the dialogue at all times,

— the capability for the user to recover easily from errors, and

— avoiding requiring the user to input more information than is necessary for successful task performance or input information that is currently available in the system.

6.4.2 Minimize cursor movement

The user actions required to move the cursor from one entry field to the next should be minimized.

EXAMPLE A tab key is used to jump from field to field.

6.4.3 Input device independency

If multiple input device access is available to the application, all form elements should be operable by all available input devices (i.e. device independent).

EXAMPLE A user can complete a form field using the keyboard, a mouse or voice input.

6.4.4 Pointing devices

If a pointing device can be used for input in a form it should be usable for navigation as well.

6.4.5 Switching between input devices

If appropriate to the task, the need for the user to switch between different input devices when filling in a form should be minimized.

EXAMPLE 1 Fields that require text entry within a logical group on a form are grouped separately from those that can be completed with a pointing device.

EXAMPLE 2 Multiple data entry methods are available for use in the same field where appropriate.

EXAMPLE 3 Navigation to all form fields with all input devices is provided for a given form.

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6.4.6 Incomplete text entry field

If the (required) number of characters entered into the field does not fill the whole field, the user should be allowed to move directly to the next field (without, for example, requiring the user to enter blank spaces to complete the field).

6.5 User control

6.5.1 Changes or corrections

If user changes in a form can impact a database accessed by multiple users and/or this results in negative consequences, the user should be allowed to go back to the initial state of the form or dialogue at any time and start over again, cancel entries or change any entry before the form is processed by the computer.

6.5.2 Immediate processing of user input

6.5.2.1 If a change in a form results in only visual changes on the screen and local storage of the data, and if it can be reversed without negative consequences, user inputs should be processed immediately and then transferred to the database on user confirmation.

EXAMPLE The choice of an option in the first field of a form changes the values visible in the second field, the user can go back and change the selection in the first field without affecting the data in the database.

6.5.2.2 If changes in a dialogue box can be reversed without negative consequences and user performance will benefit, user inputs should be processed immediately without a confirming action by the user. See also 6.5.8.

EXAMPLE When making desktop settings such as background colour and font, the changes are immediately reflected in the desktop as the user makes the selections. No push button confirmation is required.

6.5.2.3 If user input is processed immediately without user confirmation, as recommended by 6.5.2.1 or 6.5.2.2, the user should be allowed to go back to the initial state of the form or dialogue at any time and start over again, cancel entries or change any entry before the form or dialogue box is closed.

6.5.3 Identifying and locating errors

6.5.3.1 Multiple fields

If validation checking of multiple fields detects fields in error and if appropriate to the task, these fields should be indicated and the cursor should be placed on the first field in error and the user should be allowed to easily move through the fields in error to correct the entries.

EXAMPLE 1 All fields in error are highlighted by the reverse video display of these fields.

EXAMPLE 2 Fields for correction are indicated by an asterisk as well as a visual highlight.

6.5.3.2 Dependencies

If there are dependencies between fields, and if it is appropriate to the task, potential errors resulting from such dependencies should be indicated.

6.5.4 Re-entering data

If the field contains an error, the user should be required only to correct the erroneous part of the input.

NOTE In the case of data involving security or authorization information, it could be necessary for an entire field, or fields, to be re-entered.

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6.5.5 Disabled areas

The user should not be able to enter information in areas of the screen display not available for user input (e.g. read-only fields), and these areas should give visual cues and information to screen readers indicating that they are disabled.

NOTE 1 A cursor might be placed in a disabled field for the purposes of selection to copy and paste content to other fields.

NOTE 2 If users want to get context-sensitive help on read-only fields, it could be necessary to allow the focus indicator to move to read-only fields, so that keyboard mechanisms for activating the Help can be used (e.g. F1).

6.5.6 Easy transmission

If transmission of the form is required, transmission of the field entries to be processed should be accomplished by means of a simple, explicit action.

The transmission action should take place no matter where the cursor is currently located on the form, i.e. the user is not required to navigate to a particular field in order to use the transmission control key(s).

NOTE If the form is to be completed by a blind user, it is useful to provide a submit button that the user can select at any time, after having had the opportunity to review all the form fields.

6.5.7 User control information

Unless it is obvious to the user, the form should state how to carry out the following actions, if provided:

a) signal completion of the form or dialogue box and redisplay an empty form (with default values, if appropriate) for the entry of new data;

b) signal completion of the form and redisplay the previously completed version of the form or dialogue box or a default version (template) of the form or dialogue box;

c) dismiss the form or dialogue box without changing any data in the system, e.g. by means of the “Escape” or “Cancel” function;

d) use “Undo”.

6.5.8 Dismissing dialogue boxes

6.5.8.1 Single actions

if the expected use of the dialogue box involves the single application of a set of inputs, the dialogue box should contain a button that applies the input and dismisses it.

6.5.8.2 Multiple actions

If the expected use of the dialogue box or form involves multiple applications of sets of user input, the dialogue box should have a form element that applies the input without closing the dialogue box and a form element that closes the dialogue.

EXAMPLE In a dialogue box for typing in names and addresses, the user has a push button labelled “Add” for applying the input and clearing the fields for the next entry. There is also a push button labelled “Close” for closing the dialogue box.

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