
**Ergonomic requirements for office work
with visual display terminals (VDTs) —**

Part 13:
User guidance

*Exigences ergonomiques pour travail de bureau avec terminaux à écrans
de visualisation (TEV) —*

Partie 13: Guidage de l'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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9241-13 was prepared by Technical Committee 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 3: Visual display requirements*
- *Part 4: Keyboard requirements*
- *Part 5: Workstation layout and postural requirements*
- *Part 6: Guidance on the work environment*
- *Part 7: Requirements for display with reflections*
- *Part 8: Requirements for displayed colours*
- *Part 9: Requirements for nonkeyboard input devices*
- *Part 10: Dialogue principles*
- *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*

Annexes A and B of this part of ISO 9241 are information only.

Introduction

This part of ISO 9241 deals with user guidance aspects of software user interfaces.

The main purpose of user guidance is to aid the user's interaction with the system by

- promoting efficient system use;
- avoiding unnecessary mental workload;
- providing support to users to manage error situations; and
- providing support for users of different skill levels.

This part of ISO 9241 serves the following types of users:

- the designer of the user guidance, who will apply this part of ISO 9241 during the development process;
- designers of user guidance development tools to be used by dialogue designers;
- the buyer, who will reference this part of ISO 9241 during the product procurement process, and whose end-users will gain from the potential benefits provided by this part; and
- those responsible for ensuring that products meet the recommendations in this part of ISO 9241.

The ultimate beneficiary of this part of ISO 9241 will be the end-user at the visual display terminal (VDT). It was the needs of this user that provided the ergonomic recommendations in this part of ISO 9241. Although it is unlikely that the end-user will read this part or even know of its existence, its application should provide user interfaces that are more usable, consistent and that enable greater productivity.

Application of this part of ISO 9241 involves an understanding of the intended user, the user environment and tasks. User tasks should be listed and key tasks, defined as the most frequent and important tasks, should be explicitly identified.

Recommendations on how to use this part of ISO 9241 can be found in Informative Annex A.

For practical reasons, the following structure has been chosen for presenting the user guidance recommendations:

- common guidance recommendations (see clause 5),
- prompts (see clause 6),
- feedback (see clause 7),
- status information (see clause 8),
- error management (see clause 9),
- on-line help (see clause 10).

Ergonomic requirements for office work with visual display terminals (VDTs) —

Part 13: User guidance

1 Scope

This part of ISO 9241 provides recommendations for user guidance attributes of software user interfaces and their evaluation. User guidance as defined in this part of ISO 9241 is information additional to the regular user-computer-dialogue that is provided to the user on request or is automatically provided by the system. In addition to the general guidance provided in this part of ISO 9241, recommendations concerning dialogue-specific user guidance are provided in ISO 9241-12, ISO 9241-14, ISO 9241-15, ISO 9241-16 and ISO 9241-17.

This part of ISO 9241 is applicable to interaction components that aid users in recovering from error conditions. User guidance as covered by this part of ISO 9241 includes recommendations specific to prompts, feedback and status, error management and on-line help as well as general recommendations common to all these types of user guidance.

While user support can be provided via other means (e.g., on-line tutorials, on-line documentation, intelligent system performance aids) these types of support are not addressed by this part of ISO 9241-13.

The recommendations in this part of ISO 9241 are formulated to be independent of applications, environment, or implementation technology. They correspond to typical situations involving special needs for information and actions.

As with other parts of ISO 9241, this part of ISO 9241 can apply in all or in part. For example, applications that do not have browsable help would not need to follow recommendations concerning this class of user guidance.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 9241. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9241 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 9241-12:—¹⁾, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 12: Presentation of information.*

ISO 9241-14:1997, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 14: Menu dialogues.*

ISO 9241-15:1997, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 15: Command Dialogues.*

ISO 9241-16:—¹⁾, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 16: Direct manipulation dialogues.*

ISO 9241-17:—¹⁾, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 17: Form filling dialogues.*

1) To be published.

3 Definitions

For the purposes of this part of ISO 9241, the following definitions apply.

3.1 browsable help: Help in which access to help is independent of the current task context. Help topics can be accessed in the order and sequence desired by the user.

3.2 context-sensitive help: Help in which the help text or range of help topics is derived from the contextual information associated with the user's task, user's last input, selected object, current location or the current mode within the system or application.

3.3 error: Mismatch between the user's goal and the response of the system. Errors can include navigation errors, syntax errors, conceptual errors, etc.

3.4 error management: Means to support the user in error detection, error explanation, or error recovery.

3.5 error prevention: Means to minimize the probability of the occurrence of errors.

3.6 feedback: Output presented to the user by the system in reaction to the user's input or a system event.

3.7 guidance: Dialogue elements that aid the users in achieving their intended results. Guidance can aid users in discovering the capabilities of a system, enable the users to generate a plan for accomplishing their goals, assist the users in accomplishing a goal, or help the users to manage error situations.

3.8 on-line help: Additional user guidance information beyond prompting, feedback, status, and error messages that can be obtained at the user's initiative or at the initiative of the system. Information about features of the system and dialogue and how they can be used to aid the user in completion of his/her task(s) is typically provided.

3.9 prompt: System output requesting input from the user.

3.10 status information: Information indicating the current state of the system.

3.11 system-initiated guidance: Guidance that is presented to the user by the system when the user has not taken an explicit action to request the guidance.

NOTE System-initiated guidance includes, for example, prompts, feedback, status information, etc.

3.12 user guidance: Additional information beyond the regular user-computer dialogue that is provided to the user on request or is automatically provided by the system.

3.13 user-initiated guidance: Guidance that is presented to the user only when the user has taken an explicit action to request the guidance.

4 Application of this part of ISO 9241

4.1 Appropriateness of user guidance

User guidance is appropriate to all styles of interaction, types of dialogues and contexts, to help users in accomplishing their tasks.

4.2 Applying the recommendations

General ergonomic design objectives are provided in Clauses 5 to 10. The individual recommendations aimed at achieving these objectives should be applied within the specific context for which they are relevant (e.g., particular kinds of users, tasks, environments, technology). The format for the individual recommendations is: statement of the recommendation, example (if appropriate), and notes (if appropriate). Examples provided for the various recommendations generally depict an implementation that embodies the recommendation. Some examples also indicate preferred solutions.

Individual recommendations should be evaluated for their applicability and, if judged to be applicable, should be implemented in the relevant user guidance unless there is evidence that to do so would cause deviation from the design objectives or would result in an overall degradation in usability. When determining applicability, the recommendations generally should be evaluated in the order presented in the relevant clause or subclause. In judging whether applicable recommendations have been met, evaluators should evaluate the product or observe representative users of the product in the context of accomplishing the user's tasks via the user guidance. Sample procedures which support the determination of applicability and for determining whether a recommendation has been followed are provided in Annex A.

4.3 Evaluation of products

If a product is claimed to have met the applicable recommendations in this part of ISO 9241, the procedure used in establishing requirements for, developing, and/or evaluating, the user guidance shall be specified. The level of specification of the procedure is a matter of negotiation between the involved parties.

Users of this part of ISO 9241 can either utilize the procedures provided in Annex A, or develop another procedure tailored to their particular development and/or evaluation environment.

5 Common guidance recommendations

5.1 Description

This clause addresses general recommendations that are applicable to user guidance (i.e., prompts, feedback, status, error management, on-line help).

5.2 General recommendations

5.2.1 User guidance information should be readily distinguishable from other displayed information. (For recommendations concerning the presentation of visual information using graphical objects and coding techniques, see ISO 9241-17:—²⁾, Clauses 6 and 7).

EXAMPLE: When a user requests guidance, a separate dialogue box appears which has a different background colour.

5.2.2 If system-initiated user guidance messages are no longer applicable to the current system state or user actions, the information should be removed from the display.

5.2.3 User-initiated guidance should stay under the control of the user.

5.2.4 User guidance messages should provide the user with specific information relative to the task context rather than generic messages.

EXAMPLE: Days must be in the range from 1 to 31
instead of
Invalid data.

5.2.5 User guidance should not disrupt the user's task and the continuation of the dialogue.

2) To be published.

5.2.6 Distinctive message or coding techniques should be consistently used to alert users to conditions that require special attention.

5.2.7 Users should be able to specify the level of guidance they want if interaction with the system varies on the basis of user expertise.

5.3 Phrasing of user guidance

5.3.1 The result of an action should be stated before describing how to execute the action.

EXAMPLE: To clear the screen, press RETURN.
instead of
Press RETURN to clear the screen.

5.3.2 User guidance messages should be phrased to enhance the perception of user control rather than system control of the task.

EXAMPLE: To save your changes, press OK.
instead of
The system will only save your changes, if you press [OK].

5.3.3 In general, user guidance messages should be worded as positive statements to emphasize 'what to do' rather than 'what to avoid'. However, negating statements should be used for denoting exceptions to rules or to emphasize a point.

EXAMPLE: To remove characters to the left of the cursor use the 'backspace key', not the 'delete key'.

EXAMPLE: Do not use the tape drive when the backup program is running
instead of
Data can be stored on the disk or tape drive except when the backup program is active.

5.3.4 User guidance should be phrased using consistent grammatical construction.

EXAMPLE:	The available options are:		The available options are:
	display file		display file
	print file	instead of	file print
	delete file		deletion of a file

5.3.5 If user guidance contains written or spoken text, it should be stated in short, simple sentences.

5.3.6 User guidance should be stated in the active voice unless it conflicts with the users' national language.

5.3.7 User guidance should use terminology that the user population typically uses to perform its tasks.

NOTE: Use of user terminology avoids the use of designer terminology which may not be appropriate for the task.

5.3.8 User guidance messages should be worded using terms which are emotionally neutral, such that

- they are not patronizing to the user,
- human characteristics are not inappropriately implied, and
- they do not contain inappropriate attempts at humour.

6 Prompts

6.1 Description

Prompts indicate that the system is available for input. Prompts can be generic or specific. Generic prompts indicate that the system is waiting for user input, but do not explicitly indicate the type of input expected (e.g. DOS ">", the UNIX command prompt "\$"). Specific prompts indicate that the system is waiting for user input as well as direct the user to the type of input that is valid at this point in the dialogue (e.g. Type the name of the file to be loaded:).

6.2 Prompting recommendations

Many of the recommendations for prompts are equally applicable to 'labels' as they appear in form filling dialogues. For more information, see ISO 9241-17:—³⁾, 5.3.

6.2.1 Prompts should indicate implicitly (generic prompt) or explicitly (specific prompt) the types of input that will be accepted by the dialogue system.

6.2.2 Specific prompts should be displayed under the following conditions. As more conditions are met, the greater the applicability of specific prompts.

- a) Users are unfamiliar with the system and will need information on how to proceed.
- b) There is a limited set of valid inputs.
- c) Task requirements (e.g. complicated task, task requires sequenced steps, or need to minimize errors) suggest that user inputs should be guided.

6.2.3 Generic prompts should be displayed under the following conditions. As more conditions are met, the greater the applicability of generic prompts.

- a) Conditions for specific prompts are not applicable.
- b) There are many valid user inputs and there is insufficient display space to provide information on all alternatives.

NOTE When generic prompts are used, it is important to take into account different types of users (i.e., those who are familiar with prompts and those who are not).

6.2.4 The user should be able to obtain on-line help related to prompts that are complex or that the user does not understand.

6.2.5 If a task requires a particular sequence of user actions, prompting for the currently required step should be provided. (See also ISO 9241-12:—³⁾, 6.2.5.)

6.2.6 Prompts for data/command entry should be displayed in a standard location next to the entry field.

EXAMPLE: In languages that are written from left to right, the prompt is presented to the left of the entry field.

6.2.7 If a default value has been defined for user-prompted input, that value should be visually indicated. (See also ISO 9241-17:—³⁾, Clause 6.1.3.)

EXAMPLE: How many windows should be visible at login? **2**

6.2.8 Prompts should provide cues for the type of data to be entered by formatting data entry fields consistently and distinctively. (See also ISO 9241-17:—³⁾, 5.3.7.)

EXAMPLE: Enter the current date: __/__/__

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6.2.9 To facilitate response to prompts, the cursor should be automatically positioned in the input field at a location that is consistent with the type of input requested.

EXAMPLE: Numeric data arranged in columns are right justified, i.e., the cursor is positioned at the right-most position in the input field and numbers move to the left as they are typed. Textual data are left justified, i.e., the cursor is positioned at the left-most position in the input field and the cursor moves to the right as characters are typed.

7 Feedback

7.1 Description

Feedback provides information in response to the user's input. The type of feedback varies with changes in task, system state and user input.

Examples of feedback include

- echoing characters on the screen as the user types them;
- presentation of a message indicating a command has been received and is being processed;
- the visible change in a graphical data area after a command to modify its elements;
- presentation of a help window when the user presses a help key;
- moving the pointer on the screen to track mouse movement.

7.2 Feedback recommendations

7.2.1 Every input by the user should produce timely and perceptible feedback from the system. (See also ISO 9241-15:1997, 7.9 and ISO 9241-17:—⁴), 7.1.)

EXAMPLE: Key entries are echoed in the display within 150 ms of the user typing them, unless there are security requirements for not echoing characters.

7.2.2 Feedback associated with normal task performance should be non-intrusive and should not distract the user from the task.

NOTE This recommendation does not apply to user guidance messages, like delete confirmations or alerts relating to safety critical events, that need to intrude into the user's task flow in order to elicit a considered response by the user.

7.2.3 The type of feedback given by the system should take into account:

- a) User characteristics: the feedback modality should be compatible with the capabilities of the user (e.g. a system designed for blind individuals should provide feedback through speech in addition to vision).
- b) Population variability: feedback for novice users should contain more explanatory information than feedback for experienced users.
- c) Task information requirements: feedback should be compatible with the attention demands of the task.

EXAMPLE: The task requires users to look away from the display; therefore a type of feedback other than visual display is presented (e.g., voice, auditory tone).

- d) System capabilities: the presentation of feedback should not be dependent on the availability of specific hardware (e.g. do not use speech output as the only feedback if some systems do not have speech output capabilities).

4) To be published.

7.2.4 The system should clearly indicate its state whenever the state (or mode) changes.

EXAMPLE: When the user types an interrupt sequence into the system, an indication of the new system state is provided.

7.2.5 When a user selects a displayed item in order to perform some operation on it or to execute it, the item should be highlighted. (See also ISO 9241-14:1997, 7.1.4.)

7.2.6 If servicing of remote requests is provided (e.g. print a document on a remote printer), a message should be provided on the local machine to confirm that the remote service request is being processed. (See also 9241-17:—⁵, 7.4.)

7.2.7 Feedback on completion of user requests should be provided. (See also ISO 9241-17:—⁵, 7.5.)

7.2.8 If completion of a user request is not immediate, an indication should be provided by the dialogue system that the request has been accepted. The dialogue system should also indicate when the request has been successfully completed.

EXAMPLE: Users are provided with an indication when processing is complete. When an operation will take longer than 5 s to complete, an hourglass is shown to indicate that the operation is still in progress.

7.2.9 System response (feedback) to user entries should be appropriate so that it does not distract the user from the task (i.e. neither too slow nor too fast).

EXAMPLE 1: Feedback relative to moving to a new form field is given in under 250 ms.

EXAMPLE 2: Movement of a pointer on a display is visible within 100 ms of the movement of the pointing device (e.g. mouse).

8 Status information

8.1 Description

Status is user guidance information that indicates the current state of components in the system hardware and/or software. It includes information about available and active applications, modes, processes and hardware, etc. Status information can be presented at different levels of detail. The level of detail in status information needs to be appropriate to the user's current task. While all users can benefit from status information, it can provide a greater benefit to more experienced users who have learned enough about the system to adjust their actions to changes in the system state.

Examples of areas in which status information is provided include:

- networking or mail: summary of requested messages, other systems, or users available for communication;
- remote or local devices: queued documents waiting for printout, device malfunctions, and print completion;
- multi-tasking: summary of active processes or system load;
- currently selected items;
- current state of controls (e.g. radio buttons, check boxes).

⁵) To be published.

Status, as handled in this part of ISO 9241, does not include information associated with error conditions.

8.2 Status recommendations

8.2.1 Status information should be continuously presented under the following conditions. As more conditions are met, the greater the applicability of continuously presenting status information.

- a) The information is relevant to the user's current task, and delays in the presentation of the information will lead to task errors, performance decrements or serious system failures.
- b) The information is continuously relevant to the user's current task and the system has sufficient resources (e.g. processing capabilities and display space) to accommodate both status and task information.

8.2.2 Status information should be automatically presented under the following conditions. As more conditions are met, the greater the applicability of automatically presented status information.

- a) The status information is relevant to the user's task, and its automatic presentation is not likely to disrupt user task performance.
- b) The status information is the only feedback provided for a user action (e.g. an object changes colour to show it has been selected).
- c) Users have minimal training or experience with the system or application and do not know how to request status information.
- d) Use of the system or application is infrequent.
- e) Changes in the system state affect the response of the system to user input (e.g. change in the availability of peripheral devices).

8.2.3 Status information should only be presented in response to a user request under the following conditions. As more conditions are met, the greater the applicability of presenting status information only in response to user request.

- a) The information is not relevant to the user's current task.
- b) The information is non-critical and useful for only a subset of the potential users.
- c) The information is only occasionally needed to guide user responses.
- d) The status information is non-critical and rapidly changing and frequent changes in displayed information are likely to be disruptive to the user's task.

8.2.4 A consistent display (window) location should be used for each type of status information.

EXAMPLE: Whenever new mail is received, status information is presented in a box in a specified area, (e.g., in the upper right-hand corner of the screen).

8.2.5 If user input is disabled by the dialogue system (e.g. keyboard locked), the user should be given a cue (visual or auditory) indicating this state.

8.2.6 If a system or application has modes (i.e. a specific user action has different results depending on the state of the system), users should be able to discriminate the current mode from other modes.

EXAMPLE 1: In a task in which the user cannot see the display across mode changes, auditory cues are provided to discriminate modes.

EXAMPLE 2: The "off" or "on" status of a check button is indicated in a graphic that is placed to the left of the check button label.