
**Ergonomics of human-system
interaction —**

**Part 110:
Interaction principles**

Ergonomie de l'interaction homme-système —

Partie 110: Principes d'interaction

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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).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This second edition cancels and replaces the first edition (ISO 9241-110:2006), which has been substantially technically revised.

The main changes compared to the previous edition are as follows:

- the principle of individualization has been merged into the principle of controllability;
- a new principle on user engagement has been developed;
- existing principles and general design recommendations have been revised.

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

Introduction

This document describes interaction principles (formerly referred to as "dialogue principles") and general design recommendations which are independent of any specific interaction technique and which are applicable in the analysis, design and evaluation of interactive systems.

This document significantly revises and updates the first edition. It incorporates relevant guidance previously contained in ISO 14915-1. The general design recommendations in this document are derived from a combination of ergonomics research and various sources of general and heuristic guidance (including Bastien^[16], Dzida^[19], Molich^[23], Nielsen^[24] and Tognazzini^[29]).

These interaction principles and general design recommendations can guide the development and evaluation of user interfaces, leading to improved usability.

The priority with which each interaction principle or general design recommendation is applied depends on the purpose of the interactive system, the characteristics of the intended and foreseeable users of the system, the tasks, the environment, the specific interaction technique used and the consequences arising from use. Guidance on identifying relevant aspects of the users, tasks and environment of use is given in ISO 9241-11.

The ultimate beneficiary of this document will be the user of an interactive system. Although it is unlikely that the user will read this document or even know of its existence, its application by the developers of the interactive system will lead to user interfaces which are more usable, accessible, consistent and that enable greater productivity and a more positive user experience, and which avoid harm from use. The benefits for suppliers of interactive systems include increased sales, customer satisfaction and loyalty, decreased costs of providing service.

Applying these interaction principles and the associated general design recommendations also helps prevent users of those products from experiencing usability problems such as:

- additional unnecessary steps not required as part of the task;
- misleading information;
- insufficient and poor information on the user interface;
- unexpected responses of the interactive system (including those leading to harm from use);
- navigational limitations during use; and
- inefficient error recovery.

This document comprises the following:

- a) a framework for applying the interaction principles and general design recommendations;
- b) the interaction principles;
- c) general design recommendations corresponding to the interaction principles.

