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Ergonomics of human-system interaction —

Part 220: Processes for enabling, executing and assessing human-centred design within organizations

Ergonomie de l'intéraction homme-système —

Partie 220: Processus de validation, d'exécution et d'évaluation de la conception centrée sur l'opérateur humain au sein des organisations

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Foreword

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

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

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

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

For an explanation 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*.

This first edition of ISO 9241-220 cancels and replaces ISO/TR 18529:2000.

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.

Introduction

This document describes processes that represent good practice for human-centred design within and across projects. Human-centred design is an approach to system design and development that aims to improve usability, accessibility and user experience and avoid harm from use, by focussing on the use of the system.

The primary intended users of this document are professionals responsible for institutionalising human-centred design in an organization, who need to specify, assess and improve human-centred design in the organization. This application needs the clear and consistent structure that is provided by process definitions, as described in ISO/IEC TR 24774. For an introduction to human-centred design, see ISO 9241-210 (described below).

Process models were developed to provide:

— the potential to analyse the ability of an organization to deliver and/or maintain a system that meets a required level of performance and quality;

— a description of the factors that hinder this ability; and

— a means of addressing such shortcomings and mitigating associated risks of adverse consequences.

These have led to the widespread adoption of process modelling and assessment as an element in the assurance of timely and effective system delivery. Processes are defined at the level of **what** is done to develop and operate a system or organization.

The processes in this document represent good practice in human-centred design from a range of industries. They are described from the perspective of those who analyse, design and evaluate the human use of interactive systems. This includes associated requirements for project management and top management support for human-centred design.

This document uses the same structured format as other International Standards for process models (such as ISO/IEC/IEEE 12207 and ISO/IEC/IEEE 15288). ISO/IEC/IEEE 12207 refers to this document for information on human-centred design and usability.

Human-centred design aims to achieve required levels of human-centred quality. In this document, human-centred quality is the collective term used to refer to usability, accessibility, user experience, and avoidance of harm from use (see Annex E).

This document can be used to:

— implement human-centred design as part of a system development or procurement process and/or support life cycle;

— assess an enterprise's existing capability to carry out the human-centred processes;

— improve the application of human-centred design as part of an existing system development process;

— develop competence in human-centred design.

For executives/top management, this document gives guidance on governance in the area of human-centred quality. Use of this guidance gives confidence that interactive systems developed and used by an organization are usable and accessible.

For managers, this document facilitates integration of human-centred design into the system life cycle and quality management system. Human-centred activities can be specified, assessed and improved as required for projects.

This document enables efficient interaction between human-centred design and other disciplines. The services and information that human-centred design staff provide to projects are defined so that their value and purpose can be understood.

Relationship to ISO 9241-210

ISO 9241-210 describes the principles of a human-centred approach and the activities necessary for human-centred design of an interactive system. Conformance is achieved by carrying out all the required activities and those recommended activities that are identified as being relevant. ISO 9241-210 describes HCD activities in less detail than this document and can be used to provide an overview of a project's basic capabilities in human-centred design.

This document extends the model in ISO 9241-210, and elaborates the principles and activities as structured processes with defined outcomes for the execution of human-centred design within a project.

Annex C identifies the specific aspects of the processes in this document that are associated with the requirements and recommendations in ISO 9241-210 by mapping between them. Application of relevant HCD processes as described in document can be used as a means of showing conformance to ISO 9241-210. The extra detail can provide a basis for organizational improvements in human-centred design where any non-compliances are identified.

Ergonomics of human-system interaction —

Part 220: Processes for enabling, executing and assessing human-centred design within organizations

1 Scope

This document describes the processes and specifies the outcomes by which human-centred design (HCD) is carried out within organizations. Human-centred design aims to meet requirements for human-centred quality (see Annex E) throughout the life cycle of interactive systems. The processes are described from the viewpoint of those responsible for the analysis, design and evaluation of the human use of interactive systems. The process descriptions include the purpose, benefits, outcomes, typical activities and work products for each process, and are for use in the specification, implementation, assessment and improvement of the activities used for human-centred design and operation in any type of system life cycle. They can also provide the basis for professional development and certification.

The processes are associated with the domains of ergonomics/human factors, human–computer interaction, usability and user experience. This document does not include specific methods for human-centred design, nor does it describe processes for organizational redesign.

The scope of this document does not include other aspects of ergonomics, which include the design of organizations as well as systems for human use, and which extend beyond the domain of design; for example in the forensic analysis of the causes of accidents and in the generation of data and methods of measurement.

NOTE 1 ISO/TS 18152 is a related standard with a broader scope than this document. It includes the organizational processes for the identification and handling of issues related to both users and other stakeholders.

The intended application of this document is computer-based interactive systems. While the processes apply to interactive systems that deliver services, they do not cover the design of those services. The relevant aspects of the processes can also be applied to simple or non-computer–based interactive systems.

NOTE 2 Human-centred design concentrates on the human-centred aspects of design and not on other aspects of design such as mechanical construction, programming or the basic design of services.

The process descriptions in this document provide the basis for a rigorous assessment of an enterprise's capability to carry out human-centred processes in compliance with the ISO/IEC 33000 family of standards.

This document is intended for use by organizations that want to address and improve their treatment of human-centred design of either their internal systems or the products and services they provide, and the procurement of systems and parts of systems. The processes can be applied by small- and medium-sized enterprises as well as by large organizations.

Copyright release for the process descriptions

Users of this document may freely reproduce the process descriptions contained in Clause 9 as part of any process assessment model, or as part of any demonstration of compatibility with this document, so that it can be used for its intended purpose.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

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

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

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

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

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

3.2
context of use
combination of users, goals and tasks, resources, and environment

Note 1 to entry: The "environment" in a context of use includes the technical, physical, social, cultural and organizational environments.

Note 2 to entry: This can apply to an existing context of use or an intended context of use.

[SOURCE: ISO 9241-11:2018, 3.1.15, modified — Note 2 to entry has been added.]

3.3
decomposition
breaking of a complex problem or system into smaller parts that are more manageable and easier to understand

3.4
effectiveness
accuracy and completeness with which users achieve specified goals

[SOURCE: ISO 9241-11:2018, 3.1.12]

3.5
efficiency
resources used in relation to the results achieved

Note 1 to entry: Typical resources include time, human effort, costs and materials.

[SOURCE: ISO 9241-11:2018, 3.1.13]

3.6
enterprise
that part of an organization with responsibility to acquire and to supply products and/or services according to agreements

Note 1 to entry: An organization may be involved in several enterprises, and an enterprise may involve one or more organizations.