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Ergonomics of human-system interaction — Specification for the process assessment of human-system issues

Ergonomie de l'interaction homme-système — Spécification pour l'évaluation de processus des aspects homme-système

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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.

ISO/PAS 18152 was prepared by Technical Committee ISO/TC 159, *Ergonomics*, Subcommittee SC 4, *Ergonomics of human-system interaction*. It extends and formalises the user-centred processes difined in ISO 13407. It is presented in a similar form to the process definitions for sofware development defined in ISO/IEC 15504 developed by ISO/IEC JTC 1/SC 7.

This edition elaborates on ISO/TR 18529.

Introduction

This specification presents a view of system life cycle processes with an emphasis on the identification and handling of issues related to people (users and other stakeholders). It is intended for use in process assessment. The specification describes a set of processes that address issues associated with humans throughout the life cycle of a system.

Process models offer:

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

b) a description of the factors that hinder this ability, and

c) the means of addressing such shortcomings and mitigating risk.

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. Process reference models have been defined for particular applications and industries. International Standard process models are being developed by ISO and ISO/IEC JTC 1. This specification provides a bridge between standardization in the area of Ergonomics (by ISO TC159) and the life cycle standardization being carried out by ISO/IEC JTC 1 *Information technology*, SC 7, *Software engineering*.

ISO/PAS 18152 makes the contents of ISO 13407 accessible to process assessors and to those familiar with, or involved in, process modelling. ISO/PAS 18152 extends the range of processes in ISO 13407 to cover the integration of human-centred design with project and organizational processes and makes a clearer separation between human-centred processes and human-centred design in the system life cycle. A mapping between ISO/PAS 18152 and ISO 13407 is provided in Annex G.

ISO/PAS 18152 informs the developers and users of process models who want to integrate Ergonomics/Human Factors processes in system, hardware and software life cycles in order to assure system usability, health and safety.

The processes in ISO/PAS 18152 (the Human-System process model, or HS model) present a collation of good practice in ergonomics/human factors, user/human-centred design and human factors integration across a range of industries worldwide. These processes are performed by a range of staff and with different degrees of rigour depending on the industrial sector, the type of system, its purpose or use and the need for an assured level of usability.

ISO/PAS 18152 has been developed with the following objectives in mind

— To provide the means of assessing and mitigating risks arising from human-system issues that will affect usability through the life cycle, both at transition points between life cycle stages and during each stage.

— To provide a description of human-system processes for use in project planning and for inter-disciplinary communication.

— As a basis for understanding and cooperation during the tendering process and for human-system capability evaluation to support contract award, either in a stand-alone manner or in conjunction with a software or system capability evaluation.

— To provide a basis for structured human-system process improvement by supplier, customer or employer organizations.

Ergonomics of human-system interaction — Specification for the process assessment of human-system issues

1 Scope

This Publicly Available Specification presents a human-systems (HS) model for use in ISO/IEC 15504-conformant assessment of the maturity of an organization in performing the processes that make a system usable, healthy and safe. It describes processes that address human-system issues and the outcomes of these processes. It details the practices and work products associated with achieving the outcomes of each process.

The model describes processes for specifying and evaluating usability, health and safety, but it does not address all processes relating to their achievement.

The model will always be tailored to the specific organizational and system context prior to use in assessment. Annex D provides advice on tailoring process models for a range of uses.

The HS model does not define the roles or competencies of staff who perform HS processes.

This specification is intended for use by process assessors and those developing process assessment models and tools. It may be informative for those responsible for human factors activities and human factors specialists. The latter groups of readers should familiarise themselves with the vocabulary of process modelling and process assessment prior to reading this specification. The Bibliography lists informative standards and texts.

This specification should be used in conjunction with ISO 13407 and ISO/IEC 15504. The latter standard provides the framework in which the process descriptions in this specification may be used. This specification defines an additional category of processes for use with other process standards, for example ISO/IEC 12207 and ISO/IEC 15288.

NOTE 1 Readers of this specification are expected to be familiar with ISO 13407 and ISO/IEC 15504.

This specification can be applied to the specification, design, assessment and operation of manned or embedded systems, hardware and software. The model can be applied to generic systems (for example consumer products), bespoke systems (for example control or defence systems) and systems which continuously change to meet changes in the business or user environment (for example management information systems). However, it will need to be tailored for each application.

NOTE 2 Copyright release for the process descriptions: Users of this specification may freely reproduce the process descriptions contained in Clause 7 and Annex A of this specification as part of any Process Assessment Model, or as part of any demonstration of compatibility with this specification, so that it can be used for its intended purpose.

2 Conformance

Those wishing to claim that derived process assessment models are conformant to this specification shall meet the conformance requirements of ISO/IEC 15504-2:2003, subclause 6.3. An example of such a conformance statement is provided by the attestation of conformance in Annex I of this specification.

3 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 6385:—[1], *Ergonomic principles in the design of work systems*

ISO/IEC 9126-1:2001, *Software engineering — Product quality — Part 1: Quality model*

ISO 9241-11:1998, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 11: Guidance on usability*

ISO 13407:1999, *Human-centred design processes for interactive systems*

ISO/IEC 15288:2002, *Systems engineering — System life cycle processes*

ISO/IEC 15504-2:2003, *Process assessment — Part 2: Performing an assessment*

ISO/IEC 15504 (all parts) *Software engineering — Process assessment*

4 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6385, ISO 9241-11, ISO 13407, ISO/IEC TR 15504-9, ISO/IEC 9126-1 and ISO/IEC 15288 apply. The terms most relevant to this specification are given below.

4.1
(process) capability
ability of a process to achieve a required goal

[ISO/IEC TR 15504-9:1998]

NOTE 1 This usage differs from human capability, military capability and operational capability. To avoid confusion, these alternative usages are avoided in this specification.

NOTE 2 The capability levels used in ISO/IEC 15504-2 are included in Annex E.

4.2
context of use
users, tasks, equipment (hardware, software and materials), and the physical and social environments in which a system is used

[ISO 9241-11:1998]

4.3
enabling system
system that complements the system of interest during its life-cycle stages, but does not contribute directly to its functionality

NOTE 1 For example, when the system enters the production stage of the life cycle, an (enabling) production system is required.

NOTE 2 Each enabling system has a life cycle of its own. This specification is applicable to each enabling system when, in its own right, it is treated as the system of interest.

1) To be published. (Revision of ISO 6385:1981)