



BSI Standards Publication

Ergonomics of human-system interaction

Part 221: Human-centred design process assessment model

National foreword

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

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Part 221: Human-centred design process assessment model

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*Partie 221: Modèle d'évaluation de processus de conception centrée
sur l'opérateur*



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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 document 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).

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

A list of all parts in the [ISO 9241](#) series can be found on the ISO website.

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 focuses on the capability of human-centred design (HCD) processes and the maturity of organizations in implementing HCD.

The primary intended users of this document are internal and external assessors or well-trained UX professionals (such as HCD process managers or HCD quality managers) responsible for assessing HCD processes in organizations that need to specify, assess and improve their HCD processes, according to the process reference model (PRM) described in [ISO 9241-220](#). The professionals responsible for institutionalizing HCD in organizations, the primary intended users of [ISO 9241-220](#), are also important users of this document since this document intends to assess their work.

This document incorporates the processes from [ISO 9241-220](#), as well as the process assessment model (PAM) according to the process measurement framework for the assessment of process capability in [ISO/IEC 33020](#). The full titles of these standards are listed in the Bibliography.

Ergonomics of human-system interaction —

Part 221:

Human-centred design process assessment model

1 Scope

This document specifies the process references model (PRM) for human-centred design (HCD) according to [ISO 9241-220](#), as well as the process assessment model (PAM) for assessing these processes, based on [ISO/IEC 33020](#) and in accordance with the requirements of [ISO/IEC 33004](#).

This HCD PAM contains a set of indicators to be considered while interpreting the intent of the HCD PRM defined in [ISO 9241-220](#). These indicators can also be applied when implementing a process improvement programme post an assessment.

NOTE 1 The PRM in this document focuses on assessing HCD processes rather than system life cycle, for example as in [ISO/IEC/IEEE 15288](#), or software life cycle, as in [ISO/IEC/IEEE 12207](#).

NOTE 2 If processes beyond the scope of [ISO 9241-220](#) are required, appropriate processes from other PRMs, such as [ISO/IEC/IEEE 12207](#), [ISO/IEC/IEEE 15288](#) or [ISO/TS 18152](#), can be added based on the business needs of the organization.

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 3 HCD 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 conformity with the [ISO/IEC 33004](#) and [ISO/IEC 33020](#).

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.

NOTE 4 The scope of application of the PAM is the same as that of the PRM, which is described in [ISO 9241-220:2019](#), Clause 1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 9241-220:2019](#), *Ergonomics of human-system interaction — Part 220: Processes for enabling, executing and assessing human-centred design within organizations*

[ISO/IEC/IEEE 24765](#), *Systems and software engineering — Vocabulary*

[ISO/IEC/IEEE 29119-1](#), *Software and systems engineering — Software testing — Part 1: General concepts*

[ISO/IEC/IEEE 29119-3](#), *Software and systems engineering — Software testing — Part 3: Test documentation*

[ISO/IEC 33001](#), *Information technology — Process assessment — Concepts and terminology*

[ISO/IEC 33020:2019](#), *Information technology — Process assessment — Process measurement framework for assessment of process capability*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in [ISO 9241-220](#), [ISO/IEC/IEEE 24765](#), [ISO/IEC/IEEE 29119-1](#), [ISO/IEC/IEEE 29119-3](#) and [ISO/IEC 33001](#) and the following apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1.1

work product

documented information

artefact produced by a process

EXAMPLE Project plan, requirements specification, design documentation, source code, test plan, test meeting minutes, schedules, budgets and incident reports.

Note 1 to entry: Work products are evidence of the achievement of process outcomes and of the performance of the relevant activities.

[SOURCE: 9241-220:2019, 3.49, modified — Additional preferred term, "documented information", added.]

3.2 Abbreviated terms

BP	base practice
GP	generic practice
HCD	human-centred design
HCP	human-centred process
IEEE	Institute of Electrical and Electronics Engineers
PA	process attribute
PAM	process assessment model
PCI	process capability indicator
PPI	process performance indicator
PRM	process reference model
WP	work product
WPC	work product characteristic

4 Conformity

The HCD PAM and PRM conform with [ISO/IEC 33004](#) and can be used as the basis for assessing process capability.

[ISO/IEC 33020](#) is used as an [ISO/IEC 33003](#)-conforming measurement framework. A statement of conformity of the PAM and PRM with the requirements of [ISO/IEC 33004](#) is provided in [Annex B](#).

Tailoring shall conform with [ISO 9241-220:2019](#), Clause 6 and Annex B.

5 PAM and capability determination

5.1 General

To determine the capability of human-centredness as part of the PAM, all processes defined by [ISO 9241-220](#) are chosen as the PRM and [ISO/IEC 33020](#) is used as measurement framework.

The measurement framework provides the necessary requirements and rules for the capability dimension (see also [ISO/IEC 33020](#) and/or [Annex A](#)). It defines a schema which enables an assessor to determine the capability level of a given process.

5.2 Process capability levels and process attributes

A process capability level is a set of process attributes (PAs) that work together to provide a major enhancement in the capability to perform a process. PAs are features of a process that can be evaluated on a scale of achievement, as a means to measure the capability of the process. PAs are applicable to all processes. Each PA addresses a specific aspect of the capability level. The levels constitute a rational way of progressing through improvement of the capability of any process. These capability levels are defined as part of the measurement framework.

Process capability levels ([Table 1](#)) and PAs ([Table 2](#)) are identical to those defined in the process measurement framework in [ISO/IEC 33020:2019](#), 5.2.

Table 1 — Process capability levels according to ISO/IEC 33020

Level 0: Incomplete process purpose	The process is not implemented or fails to achieve its process purpose.
Level 1: Performed process	The implemented process achieves its process purpose.
Level 2: Managed process	The performed process is implemented in a managed fashion (planned, monitored and adjusted) and its documented information is appropriately established, controlled and maintained.
Level 3: Established process	The managed process is implemented using a defined process which is assured and continually improved.
Level 4: Predictable process	The established process is performed predictively. Quantitative management needs are identified and measurement data are collected and analysed to identify assignable causes of variation. Corrective action is taken to address assignable causes of variation.
Level 5: Innovating process	The predictable process is continually improved to respond to changes through identified innovative approaches for process innovation.

Within the PAM of this document, the determination of capability is based upon the nine PAs defined in [ISO/IEC 33020:2019](#), Table 2.

Table 2 — Process attributes according to ISO/IEC 33020

Attribute ID	Process attributes
Level 0: Incomplete process	
Level 1: Performed process	
PA 1.1	Process performance
Level 2: Managed process	

Table 2 (continued)

Attribute ID	Process attributes
PA 2.1	Performance management
PA 2.2	Documented information management
Level 3: Established process	
PA 3.1	Process definition
PA 3.2	Process deployment
PA 3.3	Process assurance
Level 4: Predicted process	
PA 4.1	Quantitative analysis
PA 4.2	Quantitative control
Level 5: Innovative process	
PA 5.1	Process innovation

Assessment indicators are used to identify whether the process outcomes and the process attribute outcomes (achievements) are given in processes of projects in organizational units.

In this document, there are two types of assessment indicators:

- Process performance indicators (PPIs), which apply exclusively to capability level 1. They provide an indication of the extent of fulfilment of the process outcomes.
- Process capability indicators (PCIs), which apply to capability levels 1 to 5. They provide an indication of the extent of fulfilment of the process attribute achievements.

NOTE Assessment indicators are used to confirm that certain practices were performed, as shown by evidence collected during an assessment. All such evidence comes either from the examination of work products of the processes assessed or from statements made by the performers and managers of the processes. The existence of base practices and work products provide evidence of the performance of the processes associated with them. Similarly, the existence of process capability indicators provides evidence of process capability.

The evidence obtained should be recorded in a form that clearly relates to the associated assessment indicator to support the assessor's judgement that can be confirmed or verified as required by [ISO/IEC 33002](#).

5.3 Process performance indicators

Types of PPI are:

- base practices (BPs);
- work products (WPs) [in combination with work product characteristics (WPCs)].

Both BPs and WPs relate to one or more process outcomes. Consequently, BPs and WPs are always process-specific and not generic. BPs represent activity-oriented indicators. WPs represent result-oriented indicators. Both BPs and WPs are used for judging the objective evidence that an assessor is to collect and accumulate in the performance of an assessment.

NOTE The HCD PAM offers a set of WPCs (see [Annex C](#)) for each WP. These are meant to offer a good practice and state-of-the-art knowledge guide for the assessor.

5.4 Process capability indicators

There is one type of PCI relevant for this document: generic practices (GPs).

GPs are activity-oriented indicators relating to one or more process attribute achievements. In contrast to PPIs, they are of generic type, i.e. they apply to any process.

The corresponding process capability levels and PAs for levels 0 to 5 are detailed in [Clause 7](#).

NOTE An assessor collects and accumulates evidence supporting PCI during an assessment. In that respect, GPs are alternative indicator sets the assessor can use.

5.5 Process attribute rating

To enable the rating, the measurement framework provides PAs defining a measurable property of process capability. Each PA is assigned to a specific capability level. The extent of achievement of a certain PA is represented by means of a rating based on a defined rating scale. The rules from which an assessor can derive a final capability level for a given process are represented by a process capability level model. The HCD PAM uses the measurement framework defined in [ISO/IEC 33020](#).

NOTE It can be seen as good practice that at least two assessors conduct a representative HCD process assessment: a lead assessor leading the assessment and a co-assessor supporting. It is useful if at least one of the assessors has experience in mapping the HCD processes of the HCD PRM to organizations.

To support the rating of PAs, the [ISO/IEC 33020](#) measurement framework provides a defined rating scale with an option for refinement, different rating methods and different aggregation methods depending on the class of the assessment (e.g. required for organizational maturity assessments). For the rating scale within the process measurement framework, a PA is a measurable property of process capability. A PA rating is a judgement of the degree of achievement of the PA for the assessed process. The rating scale is defined by [ISO/IEC 33020](#), as shown in [Table 3](#).

Table 3 — Rating scale according to ISO/IEC 33020

N	Not achieved	There is little or no evidence of achievement of the defined PA in the assessed process.
P	Partially achieved	There is some evidence of an approach to, and some achievement of, the defined PA in the assessed process. Some aspects of achievement of the PA can be unpredictable.
L	Largely achieved	There is evidence of a systematic approach to, and significant achievement of, the defined PA in the assessed process. Some weaknesses related to this PA can exist in the assessed process.
F	Fully achieved	There is evidence of a complete and systematic approach to, and full achievement of, the defined PA in the assessed process. No significant weaknesses related to this PA exist in the assessed process.

For the rating of the degree of achievement of each process attribute, the rating scale of [ISO/IEC 33020](#) is used: not achieved, partially achieved, largely achieved, fully achieved. This ordinal scale shall be understood in terms of percentage achievement of a process attribute (shown in [Table 4](#)).

Table 4 — Rating scale percentage values according to ISO/IEC 33020

N	Not achieved	0 to ≤ 15 % achievement
P	Partially achieved	> 15 % to ≤ 50 % achievement
L	Largely achieved	> 50 % to ≤ 85 % achievement
F	Fully achieved	> 85 % to ≤ 100 % achievement

The ordinal scale may be further refined for the measures P and L as defined in [ISO/IEC 33020:2019](#), Table 5.

The rating shall follow the rating defined in [Table 5](#).

Table 5 — Refinement of rating scale and rating criteria according to ISO/IEC 33020

N	Not achieved	0 to ≤ 15 % achievement	There is little or no evidence of achievement of the defined PA in the assessed process.
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Table 5 (continued)

P-	Partially achieved	> 15 % to ≤ 32,5 % achievement	There is some evidence of an approach to, and some achievement of, the defined PA in the assessed process. Many aspects of achievement of the PA can be unpredictable.
P+	Partially achieved	> 32,5 % to ≤ 50 % achievement	There is some evidence of an approach to, and some achievement of, the defined PA in the assessed process. Some aspects of achievement of the PA can be unpredictable.
L-	Largely achieved	> 50 % to ≤ 67,5 % achievement	There is evidence of a systematic approach to, and significant achievement of, the defined PA in the assessed process. Many weaknesses related to this PA can exist in the assessed process.
L+	Largely achieved	> 67,5 % to ≤ 85 % achievement	There is evidence of a systematic approach to, and significant achievement of, the defined PA in the assessed process. Some weaknesses related to this PA can exist in the assessed process.
F	Fully achieved	> 85 % to ≤ 100 % achievement	There is evidence of a complete and systematic approach to, and full achievement of, the defined PA in the assessed process. No significant weaknesses related to this PA exist in the assessed process.

Rating and aggregation methods follow [ISO/IEC 33020](#). A process outcome is the observable result of successful achievement of the process purpose. A process attribute outcome is the observable result of achievement of a specified process attribute. Process outcomes and process attribute outcomes may be characterized as an intermediate step to providing a process attribute rating. When performing rating, the rating method employed shall be specified relevant to the class of assessment. The selected rating method(s) shall be specified in the assessment input and referenced in the assessment report.

[ISO/IEC 33020](#) provides three rating methods. Depending on the class, scope and context of the assessment, an aggregation within one process (one-dimensional, vertical aggregation), across multiple process instances (one-dimensional, horizontal aggregation) or both (two-dimensional, matrix aggregation) is performed. When performing an assessment, ratings may be summarized across one or two dimensions. The process attributes and outcomes may be attributed to be mandatory or recommended based on the cross-reference between [ISO 9241-210](#) and [ISO 9241-220](#) as shown in [ISO 9241-220:2019](#), Table C.2.

For further information regarding rating methods, see [ISO/IEC 33020](#).

5.6 Process capability level model

The process capability level model defines the rules for how the achievement of each level depends on the rating of the PAs for the assessed and all lower process capability levels. The process capability levels are defined in detail in [Clause 7](#).

The process capability level achieved by a process shall be derived from the PA ratings for that process according to the process capability level model defined in [Table 6](#).

Table 6 — Detailed process capability level model according to ISO/IEC 33020

Scale	Process attribute	Rating
Level 1	PA 1.1: Process Performance	Largely or fully
Level 2	PA 1.1: Process Performance	Fully
	PA 2.1: Performance Management	Largely or fully
	PA 2.2: Documented Information Management	Largely or fully

Table 6 (continued)

Scale	Process attribute	Rating
Level 3	PA 1.1: Process Performance	Fully
	PA 2.1: Performance Management	Fully
	PA 2.2: Documented Information Management	Fully
	PA 3.1: Process Definition	Largely or fully
	PA 3.2: Process Deployment	Largely or fully
	PA 3.3: Process Assurance	Largely or fully
Level 4	PA 1.1: Process Performance	Fully
	PA 2.1: Performance Management	Fully
	PA 2.2: Documented Information Management	Fully
	PA 3.1: Process Definition	Fully
	PA 3.2: Process Deployment	Fully
	PA 3.3: Process Assurance	Fully
	PA 4.1 Quantitative Analysis	Largely or fully
	PA 4.2: Quantitative Control	Largely or fully
Level 5	PA 1.1: Process Performance	Fully
	PA 2.1: Performance Management	Fully
	PA 2.2: Documented Information Management	Fully
	PA 3.1: Process Definition	Fully
	PA 3.2: Process Deployment	Fully
	PA 3.3: Process Assurance	Fully
	PA 4.1: Quantitative Analysis	Fully
	PA 4.2: Quantitative Control	Fully
	PA 5.1: Process Innovation	Largely or fully

As indicated in [Table 6](#), to reach the next capability level all prior PAs of the former capability levels shall be achieved fully.

As a general rule, the achievement of a given level requires a large achievement of the corresponding PAs and a full achievement of any lower-lying PA.

A process assessment is a disciplined evaluation of an organizational unit's processes against a PAM. The PAM offers process indicators that provide guidance for assessors in accumulating the necessary objective evidence to support judgements of the capability of the processes. They are not intended to be regarded as a mandatory set of checklists to be followed. To judge the presence or absence of process outcomes and process achievements, an assessment obtains objective evidence. All such evidence comes from the examination of work products and repository content of the assessed processes, and from testimony provided by the performers and managers of the assessed processes. This evidence is mapped to the process indicators to allow the establishment of the correspondence to the relevant process outcomes and PA achievements.

Although Level 1 capability of a process is only characterized by the measure of the extent to which the process outcomes are achieved, the measurement framework requires each level to reveal a PA, and thus requires the PAM to introduce at least one PCI for each capability level. Therefore, the only PCI for capability Level 1 (PA.1.1) has a single generic practice (GP 1.1.1) pointing as an editorial reference to the respective PPIs (see [Figure A.1](#) in [Annex A](#)).

Detailed information about performing an assessment can be found in [ISO/IEC 33002](#) regarding assessment activities, roles, responsibilities and competences, assessment types and assessment documentation. An example of how an assessment for information technology works in detail can be

found in ISO/IEC TS 33030. ISO/IEC TS 33060 contains a process assessment model for general system life cycle processes.

The terminology used to plan, perform and document an assessment can be found in the following sources:

- a) [ISO/IEC 33001](#) for assessment-related terminology;
- b) [ISO/IEC/IEEE 24765](#) and [ISO/IEC/IEEE 29119](#) terminology (contained in [Annex C](#));
- c) terms introduced by ISO/TC 159/SC 4 (contained in [Annex C](#)).

6 Process reference model (PRM) and process performance indicators (PPIs) (Level 1)

6.1 General

[Figure 1](#) summarizes the HCD process categories and illustrates the different levels in an organization and their responsibilities for human-centred quality.

Ensure enterprise focus on human-centred quality (HCP 1) Vision and policies are set across the enterprise		Strategy
Enable human-centred design across projects and systems (HCP 2) Defined processes, guidelines, methods, tools and qualified roles are in place across projects		Organizational infrastructure
Execute human-centred design within a project (HCP 3) Process outputs are produced with appropriate quality: • Context of use is identified • User needs are identified • User requirements are specified • User-system interaction is specified • Prototypes are produced • Evaluation results are available		Project
Introduction, operation and end of life of the system (HCP 4) • Transition in to operation is managed • Feedback on the operation is obtained • Operation of the system is supported • Changes in context of use are identified • System continues to satisfy user needs throughout its life cycle		Operation

Figure 1 — HCD processes

It is a responsibility of the top management in an organization to set vision and policies for how human-centred quality can be addressed by HCD (HCP.1). HCD across projects and systems is enabled by those responsible for (project) programme management and/or the operation of systems (HCP.2). The execution of HCD within projects and the introduction, operation and end of life of systems is carried out by people with the necessary competence within each project (HCP.3 and HCP.4). It is possible that each process category is carried out by a different organizational entity or by a combination of entities. The HCD PRM from [ISO 9241-220](#) contains HCD processes for the process groups HCP.1 to HCP.4 ([Table 7](#)).

Table 7 — HCD process reference model from ISO 9241-220

Unique identifier	Process name	Primary audiences
HCP.1	Ensure enterprise focus on human-centred quality	Executive responsible for human-centred quality
HCP.1.1	Incorporate human-centred quality in business strategy	Ensures: executive management
HCP.1.2	Institutionalize human-centred quality	
HCP.2	Enable human-centred design across projects and systems	Those responsible for (HCD) processes used by the organization
HCP.2.1	Integration of human-centred design	Ensures: project, product and usability management
HCP.2.2	Resources for human-centred design	
HCP.2.3	Authorization and control of human-centred quality	
HCP.3	Execute human-centred design within a project	Technical leadership responsible for HCD
HCP.3.1	Plan and manage human-centred design for the project	Ensures: project and product management
HCP.3.1.1	Establish human-centred quality objectives	
HCP.3.1.2	Manage threats and opportunities that can arise from use of the interactive system	
HCP.3.1.3	Define extent of human-centred design in the project	
HCP.3.1.4	Plan each HCD process activity	
HCP.3.1.5	Manage HCD process activities within the project	
HCP.3.2	Identify the context of use	
HCP.3.2.1	Identify the intended user population and differentiate groups of users	
HCP.3.2.2	Identify other aspects of the context of use and reported issues	
HCP.3.3	Establish the user requirements	
HCP.3.3.1	Identify the user needs	
HCP.3.3.2	Specify the user requirements	
HCP.3.3.3	Negotiate the user requirements in the context of a project	
HCP.3.4	Design solution that meets user requirements	
HCP.3.4.1	Specify the user-system interaction	
HCP.3.4.2	Produce and refine user interface design solutions	
HCP.3.5	User-centred evaluation	
HCP.3.5.1	Plan for evaluation throughout the project	
HCP.3.5.2	Plan each evaluation (what to evaluate and how)	
HCP.3.5.3	Carry out each evaluation	
HCP.4	Introduction, operation and end of life of a system	Technical leadership responsible for HCD
HCP.4.1	Introducing the system	Ensures: service and support management
HCP.4.2	Human-centred quality in operation	
HCP.4.3	Human-centred quality during upgrades	
HCP.4.4	Human-centred quality at the end of life of a system	

Each table related to one process in the process dimension contains the PRM and the PPIs necessary to define the PAM (Table 8). The PPIs consist of base practices, input work products and output work products.

NOTE 1 The processes in the process dimension (Table 7) are taken from the HCD PRM in ISO 9241-220. These are reproduced in Tables 9 to 32.

NOTE 2 Table 7 also lists the primary audiences for each process category.

NOTE 3 Work product characteristics and types are defined in Annex C. The work product ID is not related to the process ID. Indicators in brackets after the output work product name in Tables 9 to 32 refer to process outcome.

Table 8 — Template for the process description

PRM	Process ID	The individual processes are described in terms of process name, process purpose, process benefit and process outcomes to define the human-centred PRM. Additionally, a process identifier is provided.
	Process name	
	Process purpose	
	Process benefit	
	Process outcomes	
PPIs	BPs	A set of BPs for the process, providing a definition of the tasks and activities needed to accomplish the process purpose and fulfil the process outcomes.
	Input WPs	A number of input WPs associated with each process. See Annex C for the characteristics associated with each WP.
	Output WPs	A number of output WPs associated with each process. See Annex C for the characteristics associated with each WP.

6.2 HCP.1 process group: ensure enterprise focus on human-centred quality

6.2.1 Purpose and outcomes of HCP.1

The main audience for this set of processes is executives and management who understand that human-centred quality provides opportunities and addresses risks related to organizational or business success, corporate image or society, customer confidence, staff motivation and human-system issues in governance and services.

NOTE The content of this set of processes is likely to be communicated to executives and management by specialists who are familiar with the content of this document.

The purpose of this set of processes is to establish and maintain awareness and sensitivity to satisfying stakeholder and user needs for human-centred quality across the organization and make these needs an inherent element in an organization's business strategy.

The outcomes achieved by this set of processes are as follows:

- human-centred quality of interactive systems is treated as a corporate asset across the organization;
- policies for achieving required levels of human-centred quality are set (demonstrating senior management support for the improvement of infrastructure related to human-centred quality);
- institutionalization of human-centred design in the organization is managed;
- the organization employs HCD activities to maintain an appropriate level of human-centred quality:
 - across systems, products and services;
 - over time;

- in the market and workplace;
 - human effectiveness, cost and risk analysis results are taken into account in investment decisions.
- These outcomes are achieved by performance of the processes addressed in [Tables 9](#) and [10](#).

6.2.2 HCP.1.1 – Incorporate human-centred quality in business strategy

[Table 9](#) describes the purpose, benefits, outcomes, base practices, input work products and output work products associated with HCP.1.1.

Table 9 — Purpose, benefits, outcomes, base practices, input work products and output work products of HCP.1.1

Process ID	HCP.1.1
Process name	Incorporate human-centred quality in business strategy^a
Process purpose	Explicitly take account of the human-centred quality of interactive systems in an organization's business strategy.
Process benefit	The organization and affected stakeholders benefit from improved human-centred quality.
Process outcomes	As a result of successful implementation of this process: a) Analysis is carried out of opportunities for the organization related to human-centred quality, including the understanding and mitigation of risks. b) A corporate vision of human-centred quality as a corporate asset is created. c) Strategic objectives for the human-centred quality of the organization's interactive systems in the market or workplace are set. d) Objectives for human-centred quality are included in the organization's business operational targets. e) Investment in interactive systems takes account of the contribution of human-centred design to business effectiveness, cost benefits and risk analysis. f) Necessary resources for addressing human-centred quality are available.
^a This applies to both the human-centred quality of interactive systems acquired for use and those designed and developed by an organization. ^b The reference in the brackets indicates the relationship of the base practice to the process outcomes. ^c It is possible that this work product will be changed by this process. ^d Work product characteristics and work product types are defined in Annex C using work product IDs (e.g. 03.02).	

Table 9 (continued)

Process ID	HCP.1.1
Base practices	HCP.1.1.BP1: Determine the extent to which improved human-centred quality of interactive systems presents opportunities for the organization and poor human-centred quality of interactive systems is a threat for the organization. For a generic product, the only user could be the purchaser of the system. For a larger or more complex system, there will be more stakeholders and a user organization, but there are still different types of users with different contexts of use. Objectives are ideally set as measurable criteria. At an early stage, stakeholders other than users could also be involved. However, user involvement is a principle of ISO 9241-210. [a, b] b HCP.1.1.BP2: Decide how the organization will identify the objectives for the human-centred quality of its interactive systems. [c] HCP.1.1.BP3: Define strategic human-centred quality objectives for interactive systems. [c, d] HCP.1.1.BP4: Assess how human-centred quality is related to business benefits for the organization. [d, e] HCP.1.1.BP5: Explicitly plan for human-centred quality in financial management of programmes and infrastructure. [c, d, e, f] HCP.1.1.BP6: Analyse social, educational and technological trends in staff and users. [c, f]
Input work products	03.02 Supply strategy^{c,d} 03.03 Business strategy^{c,d} 06.10 Customer satisfaction report^d 08.08 Quality management goals and objectives^{c,d}
Output work products	03.02 Supply strategy [c]^{c,d} 03.03 Business strategy [b]^{c,d} 06.06 Investment decision report [e]^d 08.08 Quality management goals and objectives [d]^{c,d}
^a This applies to both the human-centred quality of interactive systems acquired for use and those designed and developed by an organization. ^b The reference in the brackets indicates the relationship of the base practice to the process outcomes. ^c It is possible that this work product will be changed by this process. ^d Work product characteristics and work product types are defined in Annex C using work product IDs (e.g. 03.02).	

6.2.3 HCP.1.2 – Institutionalize human-centred quality

[Table 10](#) describes the purpose, benefits, outcomes, base practices, input work products and output work products associated with HCP.1.2.

Table 10 — Purpose, benefits, outcomes, base practices, input work products and output work products of HCP.1.2

Process ID	HCP.1.2
Process name	Institutionalize human-centred quality
Process purpose	Establish and maintain a human-centred approach as normal practice in the organization.
Process benefit	The organization takes account of human-centred quality
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes. ^b It is possible that this work product will be changed by this process.	

Table 10 (continued)

Process ID	HCP.1.2
Process outcomes	a) Top management promotes a human-centred approach to system design, operation and procurement. b) The organization has a strategic vision for the value of taking account of user experience both for its products and systems for staff use. c) The extent to which targets for human-centred quality need to be achieved for different products or market segments is known. d) Human-centred design is applied in the development of interactive systems. e) The enterprise is responsive to changes in how their interactive systems are used.
Base practices	HCP.1.2.BP1: Designate a suitable member of the executive board to be responsible for championing a human-centred approach and getting top management endorsement. [a]^a HCP.1.2.BP2: Establish and communicate a policy for achieving required levels of human-centred quality in the organization. [a] HCP.1.2.BP3: Establish a continuous improvement programme for human-centred quality in the organization. [a] HCP.1.2.BP4: Establish and maintain awareness of the importance of human-centred quality. [b] HCP.1.2.BP5: Assess and define the importance of human-centred quality in different market segments, taking account of the expectations for human-centred quality of the products in those market segments. [c] HCP.1.2.BP6: Ensure acceptance of human-centred activities in the organization. [d] HCP.1.2.BP7: Develop the systems strategy to take account of user, other stakeholder and organizational requirements. [e]
Input work products	03.02 Supply strategy^b 03.03 Business strategy 03.04 System life cycle management policy^b 06.04 System life cycle model review
Output work products	03.01 Acquisition strategy [b] 03.02 Supply strategy [b]^b 03.08 Quality management policy [c] 03.04 System life-cycle management policy [d]^b 04.03 Quality management system [a, c] 06.07 System life cycle process review [e]
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes.	
^b It is possible that this work product will be changed by this process.	

6.3 HCP.2 process group: enable human-centred design across projects and systems

6.3.1 Purpose and outcomes of HCP.2

The main audience for this set of processes is business unit or department, portfolio, programme, product and HCD managers, process owners and technical specialists with cross-project or

organizational responsibilities. The types of risks addressed include threats to the corporate image or society, business survival and human-system issues in governance and services.

The outcomes achieved by this set of processes are as follows:

- the overall system development project plan (for each interactive system and across interactive systems) incorporates human-centred quality;
- business planning for each project implements the vision for human-centred quality in terms of:
 - usability;
 - accessibility;
 - user experience;
 - avoidance of harm from use;
- appropriate procedures for achieving required levels of human-centred quality by HCD activities exist:
 - for systems, products, services;
 - to support interoperability, integration, consistency of use across systems, products, services;
 - across user groups;
 - over time;
- an organizational infrastructure and staff for HCD processes is established, promoted and maintained;
- human-centred quality is an inherent element in the process of acquisition, supply and operation of each interactive system and across interactive systems, facilitating co-existence and interoperability of interactive systems;
- trade-off and risk management explicitly include human-centred quality in mitigating risks;
- human factors data necessary for the organization to carry out human-centred design and maintain acceptable levels of human-centred quality are available.

These outcomes are achieved by performance of the processes addressed in [Tables 11](#) to [13](#).

6.3.2 HCP.2.1 – Integration of human-centred design

[Table 11](#) describes the purpose, benefits, outcomes, base practices, input work products and output work products associated with HCP.2.1.

Table 11 — Purpose, benefits, outcomes, base practices, input work products and output work products of HCP.2.1

Process ID	HCP.2.1
Process name	Integration of human-centred design
Process purpose	To ensure that the organization has procedures that enable human-centred design to be appropriately integrated into all phases of the life cycle for interactive systems.
Process benefit	Human-centred design is used appropriately.
^a	The reference in the brackets indicates the relationship of the base practice to the process outcomes.
^b	It is possible that this work product will be changed by this process.

Table 11 (continued)

Process ID	HCP.2.1
Process outcomes	a) The organization has a shared understanding of human-centred design and how it is achieved. b) Human-centred design is a documented part of the systems development process and the overall system development project plan (for each interactive system and across interactive systems). c) Procedures are defined for integrating HCD activities with other system development activities. d) An effective mechanism is established for personal and technical communication related to human system issues. e) Strategic human-system issues and associated risks of harm related to systems and their use are identified and managed. f) The costs and benefits of particular HCD activities and the risks mitigated are known. g) Stakeholders relevant to the human-centred approach are involved. h) Human-centred quality objectives are included in the procurement process. i) Marketing and other relationships with external entities explicitly take account of human-centred quality as appropriate.
Base practices	HCP.2.1.BP1: Establish a common terminology for human-system issues within the organization. [a]^a HCP.2.1.BP2: Integrate human-centred design into the overall system development project plan. [b, c] HCP.2.1.BP3: Collect feedback on the management of human-system issues across the organization. [d] HCP.2.1.BP4: Develop effective procedures for communication between those responsible for human-centred design and other members of project teams. [c, d] HCP.2.1.BP5: Identify emerging human-system issues for the organization. [e, f] HCP.2.1.BP6: Identify and integrate stakeholders relevant to the human-centred approach. [g] HCP.2.1.BP7: Explicitly take account of human-centred quality in procurement. [h] HCP.2.1.BP8: Analyse image, client-relationships and competitive situation in the marketplace with respect to a human-centred approach. [i] The marketing function in an organization typically provides: — information on target user groups; — insights on key drivers of user satisfaction; — prioritization guidance based on the market situation; — objective sales data that can be correlated with usability data – for validation and ROI assessment.
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes. ^b It is possible that this work product will be changed by this process.	

Table 11 (continued)

Process ID	HCP.2.1
Input work products	3.04 System life cycle management policy ^b 3.06 System life cycle process policy ^b 3.08 Quality management policy 6.07 System life cycle process review
Output work products	2.01 System life cycle stage model [a] 3.04 System life cycle management policy [b] ^b 3.06 System life cycle process policy [c] ^b 3.11 Technical management plan [d, f] 3.08 Quality management policy [h] ^b 6.08 System life cycle improvement report [e, f]
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes.	
^b It is possible that this work product will be changed by this process.	

6.3.3 HCP.2.2 – Resources for human-centred design

[Table 12](#) describes the purpose, benefits, outcomes, base practices, input work products and output work products associated with HCP.2.2.

Table 12 — Purpose, benefits, outcomes, base practices, input work products and output work products of HCP.2.2

Process ID	HCP.2.2
Process name	Resources for human-centred design
Process purpose	To establish and maintain an effective infrastructure for human-centred design within the organization.
Process benefit	Human-centred design can be carried out as appropriate by each project.
Process outcomes	a) An agreed set of suitable HCD procedures, tools and methods representing accepted practice is used to address human-centred quality. b) Agreed HCD procedures are maintained in suitable format(s) for effective and widespread use by project members. c) Accepted design guidelines, standards and human factors data related to human-centred quality are provided and maintained in suitable format(s) for effective and widespread use by project stakeholders. d) Sufficient staff competent in human-centred design are available for all projects. e) Guidance on selecting, adapting and applying individual tools and methods to be confident that the required level of human-centred quality will be achieved is available. f) Guidance on how to assign sufficient time and budget to be confident that the required level of human-centred quality will be achieved is available.
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes.	
^b It is possible that this work product will be changed by this process.	

Table 12 (continued)

Process ID	HCP.2.2
Base practices	HCP.2.2.BP1: Define an authority to be responsible for maintaining and promoting the infrastructure for human-centred design (procedures, tools, methods, training and mentoring). [a, b]^a HCP.2.2.BP2: Select, publish, review and maintain HCD procedures, tools and methods that are usable by the organization. [b] This includes checking whether methods are used appropriately, i.e. produce valid results, and revising as necessary. HCP.2.2.BP3: Define required competences in human-centred design and appropriate assessment methods. [d] HCP.2.2.BP4: Establish training to reach and maintain required competences in human-centred design. [d] HCP.2.2.BP5: Ensure that staff are competent (including any necessary training) to apply selected procedures, tools and methods (including customising for the project context where appropriate). [d, e, f] HCP.2.2.BP6: Mentor and monitor trained individuals to ensure that competence is effectively applied in the working environment. [d, f] HCP.2.2.BP7: Select, publish and maintain design and usability (style) guidelines, standards and other information (e.g. advice on customization and resourcing) related to human-centred quality within the organization. [c, e, f] Principles, requirements and recommendations are published in various sources, including the ISO 9241 series. These typically apply across user interface platforms, e.g. “colour should be used only as an additional means to code information”. See Reference [27].
Input work products	03.04 System life cycle management policy 03.06 System life cycle process policy^b 03.07 Training strategy^b 03.08 Usability management policy
Output work products	01.03 Competent personnel register [d] 02.04 System life cycle process model [a, b] 03.06 System life cycle process policy [a]^b 03.07 Training strategy [d]^b 03.11 Technical management plan [c, e, f] The technical management plan includes HCD procedures, as well as HCD design guidelines, standards and other human factors data related to human-centred quality.
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes.	
^b It is possible that this work product will be changed by this process.	

6.3.4 HCP.2.3 – Authorization and control of human-centred quality

Table 13 describes the purpose, benefits, outcomes, base practices, input work products and output work products associated with HCP.2.3.

Table 13 — Purpose, benefits, outcomes, base practices, input work products and output work products of HCP.2.3

Process ID	HCP.2.3
Process name	Authorization and control of human-centred quality
Process purpose	The governance of human-centred design to achieve appropriate levels of human-centred quality in the acquisition, supply and operation of interactive systems.
Process benefit	Appropriate levels of human-centred quality are achieved across the organization.
Process outcomes	a) Organization-wide objectives (HCP.3.1.1) for human-centred quality are defined. b) A governance process is established to manage projects' conformity with agreed standards. c) Human-centred quality is identified as criteria for approval of interactive systems and their elements. d) Performance against organizational objectives for human-centred quality is known. e) Deficiencies in human-centred quality are addressed. f) Acquisition includes requirements for human-centred quality. g) HCD practice and capability are contractual requirements on supplying organizations.
Base practices	HCP.2.3.BP1: Define organization-wide objectives for human-centred quality based on the strategic objectives set in HCP.1.1 c), for example KPIs for human-centred quality and human-centred design. [a]^a HCP.2.3.BP2: Establish a governance process to manage the project's conformity with agreed human-centred quality-related standards. [b] HCP.2.3.BP3: Include review and sign-off of human-centred quality in all reviews and decisions. [c] HCP.2.3.BP4: Monitor the achievement of objectives for human-centred quality. [c, d] HCP.2.3.BP5: Take corrective action when deficiencies in human-centred quality are identified. [e] HCP.2.3.BP6: Include requirements for human-centred quality in the criteria for acquisition. [f] HCP.2.3.BP7: Assess and improve HCD capability in organizations carrying out design and development of interactive systems. [g]
Input work products	03.01 Acquisition strategy^b 04.01 Supplier selection procedure^b 04.03 Quality management system^b 06.01 Supplier assessment report 06.02 Delivery acceptance report 06.11 Quality management report
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes.	
^b It is possible that this work product will be changed by this process.	

Table 13 (continued)

Process ID	HCP.2.3
Output work products	03.01 Acquisition strategy [c, f] ^b 03.02 Supply strategy [c] 04.01 Supplier selection procedure [c, f] ^b 04.03 Quality management system [b, c, e] ^b 06.03 Supply performance report [d] 07.02 Acquisition agreement change request [e] 07.03 Supply proposal [c, g] 07.06 Supplier directive [c, e] 08.02 Delivery acceptance criteria [c, f, g] 08.03 Supply agreement [b, g] 08.09 Quality measures [a] An organization can be either an acquirer or a supplier. Quality criteria are applicable to internal projects as well as external acquisition.
^a	The reference in the brackets indicates the relationship of the base practice to the process outcomes.
^b	It is possible that this work product will be changed by this process.

6.4 HCP.3 process group: execute human-centred design within a project

6.4.1 Purpose and outcomes of HCP.3

The main audience for this set of processes and its sub-processes is project managers, product managers, senior HCD professionals, educators and trainers. The types of risks of harm addressed include human-system issues in the project and the system, and the quality of the system.

The purpose of this set of processes is to carry out HCD activities as appropriate in order to ensure that the system achieves appropriate human-centred quality.

NOTE Human-centred design is required to ensure human-centred quality for all types of projects, whether acquisition of a standard product, customization for use in a specific organizational context or development of a new system.

The outcomes achieved by this set of processes are as follows:

- designs or redesigns are based on user and other stakeholder requirements;
- appropriate HCD process activities are performed;
- appropriate methods are applied;
- work products contain the required content;
- appropriate human-centred quality is achieved.

This set of processes provides a means of conforming to the requirements of [ISO 9241-210](#). These outcomes are achieved by performance of the following processes.

6.4.2 HCP.3.1 process sub-group: plan and manage human-centred design for the project

6.4.2.1 Overall purpose and outcomes of HCP.3.1

The purpose of the following set of processes is to ensure that human-centred design is conducted in a systematic manner within a project and can be traced throughout the project.

The outcomes achieved by this set of processes are as follows:

- project stakeholders know which work products are needed in order to address human-centred quality;
- human-centred design is integrated in the overall project plan;
- human-centred design is conducted in a systematic manner;
- users are involved throughout the project;
- design is driven and refined by user-centred evaluation.

These outcomes are achieved by performance of the processes addressed in [Tables 14](#) to [18](#).

6.4.2.2 HCP.3.1.1: establish human-centred quality objectives

[Table 14](#) describes the purpose, benefits, outcomes, base practices, input work products and output work products associated with HCP.3.1.1.

Table 14 — Purpose, benefits, outcomes, base practices, input work products and output work products of HCP.3.1.1

Process ID	HCP.3.1.1
Process name	Establish human-centred quality objectives
Process purpose	Human-centred quality objectives for the project are defined and maintained, taking account of the benefits and potential negative consequences identified in HCP.3.1.2, preliminary information about context of use (HCP.3.2) and user needs (HCP.3.3.1).
Process benefit	The project is guided by objectives for human-centred quality. These provide a basis for managing threats and opportunities (HCP.3.1.2), defining the extent of HCD activities (HCP.3.1.3), and for providing user requirements and setting acceptance criteria (HCP.3.3.2).
Process outcomes	a) Human-centred quality objectives are derived from organizational objectives, business context, technological constraints and the intended context of use. b) Human-centred quality objectives are established and maintained for each applicable component of human-centred quality for each context of use: — Avoidance of harm where appropriate. EXAMPLE 1 The design of the medical device will ensure that use errors that cause harm are either eliminated or reduced to the extent possible. — Usability. EXAMPLE 2 The average time that air passengers entering the United States will take to pass through immigration is half the average time currently taken, while maintaining current levels of security and safety in screening arrivals.
a	The reference in the brackets indicates the relationship of the base practice to the process outcomes.
b	CIF.5 includes human-centred quality objectives.

Table 14 (continued)

Process ID	HCP.3.1.1
	— Accessibility to enable the system to be used by people with the widest range of capabilities in the intended user populations, where appropriate. EXAMPLE 3 The intended user population that is identified explicitly includes users with the widest possible range of diverse human needs and characteristics. — User experience resulting from use and/or anticipated use. EXAMPLE 4 Potential users anticipate that the new product will maintain the company's reputation as the market leader for quality and innovation. EXAMPLE 5 Users enjoy the aesthetic experience of the physical design. c) Data collection (user research) is planned and resourced according to the needs of the project. d) Identified human-centred quality objectives are an integral part of the project success criteria.
Base practices	HCP.3.1.1.BP1: Review the relevant aspects of the context of use in order to identify relevant human-centred quality objectives. [a]^a Human-centred quality objectives vary in level and detail from very high-level visions to precise target numerical values, depending on the maturity of understanding of the system and available information at the time they are stated. The more specific human-centred quality objectives are, the more they can serve as requirements for the future system. Additional human-centred quality objectives can emerge with increased understanding of the context of use. HCP.3.1.1.BP2: Identify differences in human-centred quality objectives between the intended user populations (when there is more than one user population). [b] HCP.3.1.1.BP3: Analyse the overall project objectives with respect to the impact of human-centred quality. [a, b] HCP.3.1.1.BP4: Identify value-driven human-centred quality objectives for usability, accessibility, user experience and avoidance of harm from use. [b] HCP.3.1.1.BP5: Identify areas where more information is needed to further develop the detail of the human-centred quality objectives and of the context of use. [c] HCP.3.1.1.BP6: Communicate the human-centred quality objectives to relevant project stakeholders. [d]
Input work products	CIF.3 Context of use 08.03 Supply agreement 08.12 Stakeholder requirements
Output work products	CIF.5 User requirements [b]^b 08.04 Project requirements [c, d]
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes. ^b CIF.5 includes human-centred quality objectives.	

6.4.2.3 HCP.3.1.2 – Manage threats and opportunities that arise from use of the interactive system

Table 15 describes the purpose, benefits, outcomes, base practices, input work products and output work products associated with HCP.3.1.2.

Table 15 — Purpose, benefits, outcomes, base practices, input work products and output work products of HCP.3.1.2

Process ID	HCP.3.1.2
Process name	Manage threats and opportunities that arise from use of the interactive system
Process purpose	To manage threats and opportunities related to the degree of usability, accessibility and/or user experience achieved, including issues such as inconvenience, financial harm, health, safety, privacy and security.
Process benefit	Harm that results from inadequate usability, accessibility or user experience is minimized, and opportunities provided by superior levels of human-centred quality are realized (see ISO 9241-220:2019 , Annex F for more details).
Process outcomes	a) The potential threats and opportunities related to human-centred quality are taken into account in the business case. b) The benefits of good human-centred quality are achieved for the project stakeholders for whom the success of the system is critical. c) Reasonably foreseeable harm from use is minimized or eliminated, in particular negative consequences for stakeholders for whom the success of the project or system is critical (e.g. to health, safety, finances or the environment). d) Potential opportunities related to use are considered. e) Potential conflicts between human-centred quality and other quality attributes are identified. f) Project resources for HCD are determined, based on the identified range and depth of analysis needed and an explicit assessment of threats and opportunities related to human-centred quality and health and safety.
^a	The reference in the brackets indicates the relationship of the base practice to the process outcomes.
^b	It is possible that this work product will be changed by this process.

Table 15 (continued)

Process ID	HCP.3.1.2
Base practices	HCP.3.1.2.BP1: Incorporate issues related to human-centred quality in the development of the business case. [a]^a HCP.3.1.2.BP2: Identify project stakeholders for whom the success of the system is critical. [65] [b, c] HCP.3.1.2.BP3: Establish benefits that result from superior human-centred quality. [b, d] EXAMPLE 1 Medical application: to have patients spend fewer days needing dialysis. EXAMPLE 2 Consumer product: to have fewer customers initiating service calls. HCP.3.1.2.BP4: Assess the harm that results from poor human-centred quality (for the users, organization or project, including to economic status, human life, health or the environment). [c] EXAMPLE 3 Administrative data required by expense reporting application: results in members of staff spending more time entering additional data. HCP.3.1.2.BP5: Assess potential health and safety hazards, including specific software-related risks (e.g. motion sickness in virtual reality) and general environments risks (e.g. physiological). [c] HCP.3.1.2.BP6: Consider potential opportunities based on user needs and human-centred quality (e.g. for innovative solutions). [d] HCP.3.1.2.BP7: Resolve potential conflicts between human-centred quality and other quality attributes (e.g. usability versus security or with buy-or-build decisions related to off-the-shelf components). [e] HCP.3.1.2.BP8: Determine the range and depth of analysis of the interactive system that is required to ensure human-centred quality (e.g. the related systems required to complete the task or the extent to which subsystems are analysed). [f] HCP.3.1.2.BP9: Determine project resources (including access to users) needed to mitigate risks to achievement of the required human-centred quality. [f]
Input work products	CIF.3 Context of use CIF.5 User requirements 08.04 Project requirements^b 08.12 Stakeholder requirements
Output work products	03.14 Decision-making strategy [a, d, e] 03.15 Risk management strategy [c, d] 05.04 Risk register [c, e] 06.18 Risk management report [f] 08.04 Project requirements [f]^b
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes.	
^b It is possible that this work product will be changed by this process.	

6.4.2.4 HCP.3.1.3 – Define extent of human-centred design in the project

Table 16 describes the purpose, benefits, outcomes, base practices, input work products and output work products associated with HCP.3.1.3.

Table 16 — Purpose, benefits, outcomes, base practices, input work products and output work products of HCP.3.1.3

Process ID	HCP.3.1.3
Process name	Define extent of human-centred design in the project
Process purpose	To define the HCD process outcomes and activities for the project and identify the appropriate level of HCD resources for the project.
Process benefit	The resources necessary to achieve the required level of human-centred quality are defined and integrated in the overall project plan.
Process outcomes	a) The scope of HCD process outcomes and activities needed to achieve the objectives identified by HCP.3.1.1 and the benefits identified by HCP.3.1.2 are defined. b) HCD methods are selected and customized for the project context to give sufficient confidence that the required level of human-centred quality will be achieved in each project. c) The extent of user or stakeholder involvement, evaluation and iteration needed to give sufficient confidence that emerging requirements for human-centred quality are identified. d) Human-centred design is integrated in the overall project plan, starting at the earliest stages, and taking account of the size and complexity of the interactive system and the resulting degree of decomposition of the design. e) The required resources (people, budgets, users, time) for HCD are known.
Base practices	HCP.3.1.3.BP1: Identify the necessary HCD process outcomes to be achieved through HCD to meet the human-centred quality objectives identified by HCP.3.1.1 and the benefits identified by HCP.3.1.2. [a]^a HCP.3.1.3.BP2: Identify the HCD processes activities to be carried out to achieve the HCD process outcomes. [a] HCP.3.1.3.BP3: Identify which human factors data are required by the project. [b] HCP.3.1.3.BP4: Identify the method(s) used to obtain the required data, taking account of the constraints imposed by the project and the project team's knowledge and understanding about ergonomics and user interface design. [b] HCP.3.1.3.BP5: Identify the degree of user or stakeholder involvement, evaluation and iteration required to achieve an acceptable degree of certainty of required human-centred quality. [c] HCP.3.1.3.BP6: Plan the overall set of HCD activities to be performed in order to provide human factors data, user requirements and evaluation results to guide the emerging design. [a, d] This can be carried out iteratively, for example in agile development. HCP.3.1.3.BP7: Identify resources (people, budgets, users, time) for HCD. [e]
Input work products	CIF.5 User requirements 6.18 Risk management report 8.04 Project requirements
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes. ^b Human factors integration plan is included within 3.09 and 3.11. ^c Verification and validation strategies include the evaluation plan.	

Table 16 (continued)

Process ID	HCP.3.1.3
Output work products	2.01 Tailored system life cycle stage model [a] 2.02 Tailored system life cycle process model [b] 3.09 Project management plan [b, d] ^b 3.11 Technical management plan [c] ^b 3.20 Verification strategy [b, c] ^c 3.22 Validation strategy [b, c] ^c 6.13 Project resources and services report [e] 8.10 Project team requirements [e]
^a	The reference in the brackets indicates the relationship of the base practice to the process outcomes.
^b	Human factors integration plan is included within 3.09 and 3.11.
^c	Verification and validation strategies include the evaluation plan.

6.4.2.5 HCP.3.1.4 – Plan each HCD process activity

[Table 17](#) describes the purpose, benefits, outcomes, base practices, input work products and output work products associated with HCP.3.1.4.

Table 17 — Purpose, benefits, outcomes, base practices, input work products and output work products of HCP.3.1.4

Process ID	HCP.3.1.4
Process name	Plan each HCD process activity
Process purpose	To ensure that the work products produced by each HCD activity achieve the quality required for use by the project.
Process benefit	The HCD activities needed to achieve the required levels of human-centred quality are planned.
^a	The reference in the brackets indicates the relationship of the base practice to the process outcomes.

Table 17 (continued)

Process ID	HCP.3.1.4
Process outcomes	a) The resources (people, budgets, time) required for each HCD activity are defined. b) The method(s) to be used to conduct each HCD process activity are selected and customized as appropriate. c) The necessary authorizations and approvals (e.g. ethical approval, works council agreement) are obtained. d) The work products to be delivered for each HCD process activity are defined. e) Each HCD activity is integrated in the overall project plan, allowing for any necessary iteration. f) Effective procedures are established for feedback and communication on HCD activities as they affect other design activities and trade-offs. g) Representative users of the system are available to participate in HCD activities where necessary. h) The composition of the design team includes sufficient diversity in expertise to collaborate over design and implementation trade-off decisions at appropriate times. i) Suitably qualified and experienced staff are available to carry out HCD activities.
Base practices	HCP.3.1.4.BP1: Identify resources required (in terms of time, delay and effort) and allow for sufficient investigation and iteration in order to meet human-centred quality objectives. [a]^a HCP.3.1.4.BP2: Select method(s) for conducting each HCD activity. [b] HCP.3.1.4.BP3: Customize HCD procedures and customize associated tools and methods as appropriate to provide sufficient and timely information to the project. [b, d] HCP.3.1.4.BP4: Obtain necessary authorizations and approvals (e.g. ethical approval). [c] HCP.3.1.4.BP5: Define work products to be produced by each HCD process activity (see Annex C). [d] HCP.3.1.4.BP6: Define suitable formats for the work products that result from the HCD process activities. [d] HCP.3.1.4.BP7: Identify at which point of time each work product is needed in the project. [e] HCP.3.1.4.BP8: Plan each HCD process activity in terms of resources (people with appropriate skills, budgets, time). [a, e] HCP.3.1.4.BP9: Plan how feedback on the results of HCD activities will be communicated to other design activities and trade-offs, including an explanation and justification of any design recommendations. [f] HCP.3.1.4.BP10: Involve representative users in the design and evaluation process as appropriate in order to collect user feedback for use in the design of organizational and technical systems. [g, h] HCP.3.1.4.BP11: Assign competent staff (internal or external) to conduct each HCD activity. [a, h, i]
Input work products	3.11 Technical management plan
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes.	

Table 17 (continued)

Process ID	HCP.3.1.4
Output work products	03.09 Project management plan [b, d, e, f] 03.10 Project acquisition plan [a, f, g, h] 03.13 Project quality plan [c, i]
^a The reference in the brackets indicates the relationship of the base practice to the process outcomes.	

6.4.2.6 HCP.3.1.5 – Manage HCD process activities within the project

[Table 18](#) describes the purpose, benefits, outcomes, base practices, input work products and output work products associated with HCP.3.1.5.

Table 18 — Purpose, benefits, outcomes, base practices, input work products and output work products of HCP.3.1.5

Process ID	HCP.3.1.5
Process name	Manage HCD process activities within the project
Process purpose	To ensure that each HCD process activity is conducted as planned, specified work products achieve the required quality and are delivered at the right time for use in the project.
Process benefit	The HCD process activities needed to achieve the required levels of human-centred quality is carried out.
Process outcomes	a) Each HCD process activity is conducted as defined to deliver the specified work product. b) Required work products of HCD process activities are available when needed as input to the project. c) System work products (e.g. system architecture) are improved where necessary based on the results of HCD activities. d) The project plan and HCD activities are adjusted where necessary based on emergent data delivered by HCD activities. e) Work is conducted according to the organizational objectives for human-centred design and human-centred quality (see HCP.2)
Base practices	HCP.3.1.5.BP1: Deliver agreed work products for each HCD process activity. [a] ^a HCP.3.1.5.BP2: Monitor the accomplishment for each HCD activity. [a, b] HCP.3.1.5.BP3: Communicate work products of each completed HCD activity to stakeholders in project. [b] HCP.3.1.5.BP4: Identify where outputs of HCD activities point to needs for iteration and lead to changes in the overall project plan in order to continue to meet human-centred quality objectives. [d] HCP.3.1.5.BP5: Review the HCD activities within the project plan throughout the life of the project. [c, e] HCP.3.1.5.BP6: Ensure that HCD work products are appropriately acted on. [d].
Input work products	3.11 Technical management plan
Output work products	06.04 System life cycle model review [d] 06.07 System life cycle process review [d] 06.11 Quality management report [a, c] 06.14 Project quality report [c, e] 06.15 Project progress report [b]

^a The reference in the brackets indicates the relationship of the base practice to the process outcomes.

6.4.3 HCP.3.2 process sub-group: identify the context of use

6.4.3.1 Overall purpose and outcomes of HCP.3.2

The purpose of this set of processes is to identify the users of the interactive system and their characteristics, the goals and tasks, the resources used and the technical, physical, social, cultural and organizational environment of the interactive system (see [ISO 9241-11](#)), and to communicate this information. This can be for a current context of use or for an intended context of use (see [ISO/IEC 25063](#)).

The outcomes achieved by this set of processes are as follows:

- the characteristics of the actual or intended user groups, their goals and their tasks, including user interaction with other users and other interactive systems, are identified;
- the operational environment of the system, including the factors that affect the performance of users, is described in sufficient detail to support the design activities;
- information about the context of use and its implications is available throughout the life cycle of the interactive system.

NOTE Analysing, designing and evaluating human use of an interactive system can be addressed for a system in its current state, specified state and future state. A range of contexts of use can be considered, including the context of introducing or selling and the context of managing the system in operation.

These outcomes are achieved by performance of the processes addressed in [Tables 19](#) and [20](#).

6.4.3.2 HCP.3.2.1 – Identify the intended user population and differentiate groups of users

[Table 19](#) describes the purpose, benefits, outcomes, base practices, input work products and output work products associated with HCP.3.2.1.

Table 19 — Purpose, benefits, outcomes, base practices, input work products and output work products of HCP.3.2.1

Process ID	HCP.3.2.1
Process name	Identify the intended user population and differentiate groups of users
Process purpose	To identify the intended user population and differentiate the groups of users taking account of the diversity of the population and describe the relevant characteristics of the identified user groups.
Process benefit	The intended user population is known and provides a basis for describing the context of use.
Process outcomes	a) User groups to be considered (for the interactive system to be designed or evaluated) are identified. b) Users with accessibility needs have been included to the greatest extent possible. c) The relevant characteristics (including the diversity of these characteristics) of each user group and their goals are described. d) User groups not to be considered (for the interactive system to be designed or evaluated) are identified.
^a	The reference in the brackets indicates the relationship of the base practice to the process outcomes.
^b	02.07 includes user group profiles, which is a synonym for a target audience description (TAD) and personas.