
**Information technology — Learning,
education and training — Quality
management, assurance and metrics —**

**Part 1:
General approach**

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*Technologies de l'information — Apprentissage, éducation et
formation — Management, assurance et métrologie de la qualité —*

Partie 1: Approche générale

ISO/IEC 19796-1:2005

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 19796-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 36, *Information technology for learning, education and training*.

ISO/IEC 19796 consists of the following parts, under the general title *Information technology — Learning, education and training — Quality management, assurance and metrics*:

— *Part 1: General approach*

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Three further parts will be developed:

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— *Part 2: Harmonized quality model*

— *Part 3: Reference methods and metrics (RMM)*

— *Part 4: Best practice and implementation guide*

Introduction

The Reference Framework for the Description of Quality Approaches (RFDQ) is a framework to describe, compare, and analyze quality management and quality assurance approaches. These approaches can be mapped to RFDQ. Therefore, the framework is not a quality management or quality assurance model – it is a framework for the description of quality approaches. It will serve to compare different existing standards and to harmonize these towards a common quality model. For a better understanding of the standard, several annexes show samples of the usage of the standard – the annexes are based on the French “Code of Practice” and German DIN PAS 1032-1. Additionally, an annex on Reference Quality Criteria (RQC) is included. These criteria shall serve as reference criteria for the analysis and evaluation of learning resources and scenarios. These criteria are also not a quality assessment approach itself, but a framework to compare different quality assurance and quality assessment approaches.

The following figure shows the levels of quality approaches and the relation of the RFDQ and RQC to existing approaches.

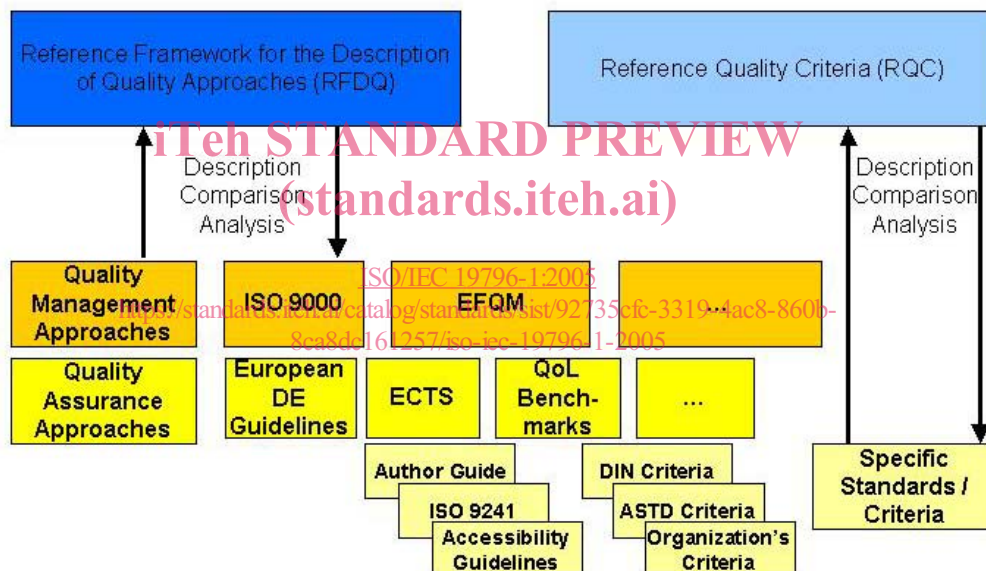


Figure 1: Levels of Quality Approaches

The following figure shows the role of the models within the standardization process.

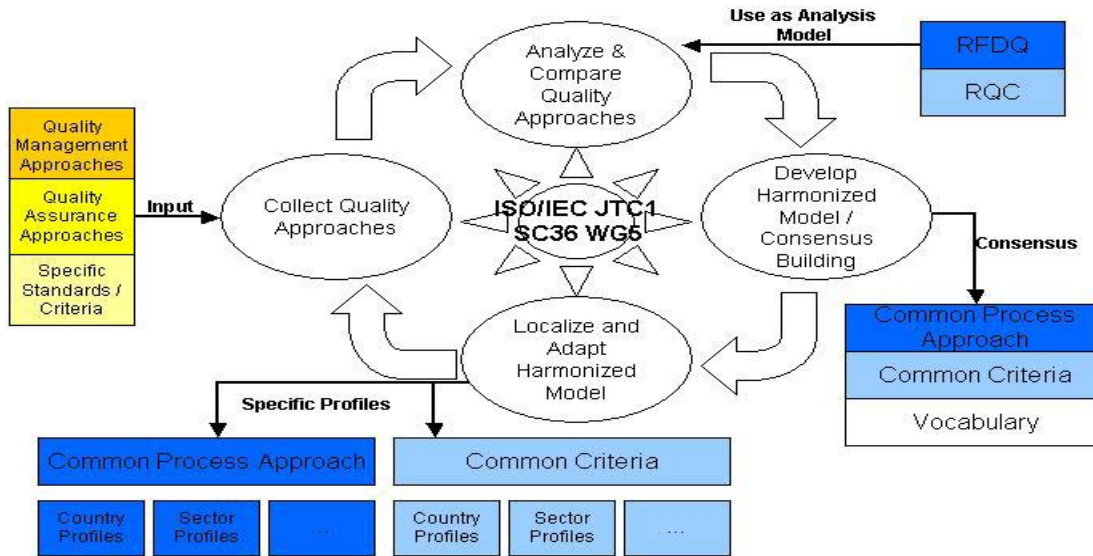


Figure 2: Standardization Process
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Chapter 3 describes the process-oriented framework for the description of quality approaches (RFDQ).

Annex A (informative) describes the use of RFDQ and the use of classifications to extend the process model introducing sub-processes.

Annex B (informative) shows the full German process model (DIN PAS 1032-1) as an example how the basic model can be extended.

Annex C (informative) describes the use of the model describing the “French Code of Practice in e-Learning” (AFNOR Z 76-001) as a second sample of the use of the standard.

Annex D (informative) provides a reference list of quality criteria which can be included in RFDQ for assessment and evaluation.

Annex E (informative) describes how other quality approaches can be mapped to RFDQ. Specifically, the Chinese Model CELTSC is used as an example of the mapping procedure.

Annex F (informative) describes the use of the model for specific quality objectives such as metadata quality.

Annex G (informative) lists references to papers used for explanatory purposes.

Information technology — Learning, education and training — Quality management, assurance and metrics —

Part 1: General approach

1 Scope

This part of ISO/IEC 19796 provides a common framework to describe, specify, and understand critical properties, characteristics, and metrics of quality. The Reference Framework for the Description of Quality Approaches (RFDQ) is an elaborated and extensive process model. This standardization work harmonizes existing concepts, specifications, terms, and definitions for learning, education, and training.

2 Terms and definitions

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

2.1

ASTD

American Society for Training and Development

<http://www.astd.org>

<https://standards.iso.org/standards/sist/92735cfc-3319-4ac8-860b-8ca8dc161257/iso-iec-19796-1-2005>

2.2

CELTSC

Chinese E-Learning Technology Standardization Committee

2.3

CWA

CEN Workshop Agreement

2.4

customer

individual or organization, such as learner, learner's parents, education institutions and potential employer, who consumes the product (studying and training) directly or indirectly

2.5

data quality

set of features such as relevance, accuracy, timeliness, punctuality, accessibility, clarity, comparability, coherence, that concern the collection, analysis, persistence, dissemination, and usage of data

2.6

DIN e.V.

Deutsches Institut für Normung e.V.

2.7
ECTS
European Credit Transfer System

2.8
EFQM
European Foundation for Quality Management

2.9
interested party

person or group (such as employee, provider, partner, investor, owner, society) whose interest is affected by performance or achievements of e-learning

2.10
process

set of interrelated or interacting activities which transforms inputs into outputs

NOTE 1 Inputs to a process are generally outputs of other processes.

NOTE 2 Processes in an organization are generally planned and carried out under controlled conditions to add value.

NOTE 3 A process where the conformity of the resulting product cannot be readily or economically verified is frequently referred to as "special process". (ISO 9000:2000)

2.11
product
result of a process

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NOTE 1 There are four generic product categories, as follows:

- services (e. g. transport); <https://standards.iteh.ai/catalog/standards/sist/92735cfc-3319-4ac8-860b-1ca8dc161257/iso-iec-19796-1-2005>
- software (e. g. computer program, dictionary);
- hardware (e. g. engine mechanical part);
- processed materials (e. g. lubricant).

Many products comprise elements belonging to different generic product categories. When the product is then called service, software, hardware or processed material depends on the dominant element. [...]

NOTE 2 Service is the result of at least one activity necessarily performed at the interface between the supplier and customer and is generally intangible. Provision of a service can involve, for example, the following:

- an activity performed on a customer-supplied tangible product (e. g. automobile to be repaired);
- an activity performed on a customer-supplied intangible product (e. g. the income statement needed to prepare a tax return);
- the delivery of an intangible product (e. g. the delivery of information in the context of knowledge transmission);
- the creation of ambience for the customer (e. g. in hotels and restaurants).

Software consists of information and is generally intangible and can be in the form of approaches, transactions or procedures.

Hardware is generally tangible and its amount is a countable characteristic. Processed materials are generally tangible and their amount is a continuous characteristic. Hardware and processed materials often are referred to as goods.

NOTE 3 Quality assurance is mainly focused on intended products.

(ISO 9000:2000)

2.12**quality**

ability of a set of inherent characteristics of a product, system or process to fulfil requirements of customers and other interested parties. (ISO 9000:2000)

2.13**quality assessment**

totality of measures carried out consistently and systematically in order to insure that a product conforms with the requirements of a stated specification (EN 180000:1995)

2.14**quality assurance (QA)**

part of quality management focused on providing confidence that quality requirements will be fulfilled (ISO 9000:2000)

2.15**quality control**

part of quality management focused on fulfilling quality requirements (ISO 9000:2000)

2.16**quality improvement**

part of quality management focused on increasing effectiveness and efficiency (ISO 9000:2000)

2.17**quality management (QM)**

coordinated activities to direct and control an organization with regard to quality (ISO 9000:2000)

NOTE Direction and control with regard to quality generally includes establishment of the quality policy and quality objectives, quality planning, quality control, quality assurance and quality improvement.

(ISO 9000:2000)

2.18**quality objective**

something sought, or aimed for, related to quality

NOTE Quality objectives should be based on the organization's quality policy. Quality objectives are specified at different levels in the organization.

(ISO 9000:2000)

2.19**QoL****Quality on the line****2.20****quality planning**

part of quality management, focused on setting quality objectives and specifying necessary operational process and related resources to fulfil the quality objectives

NOTE Establishing quality plans may be part of quality planning.

(ISO 9000:2000)

2.21**quality policy**

overall intentions and direction of an organization related to quality as formally expressed by top management

NOTE The quality policy should be consistent with the overall policy of the organization and should provide a framework for the setting of quality objectives.

(ISO 9000:2000)

2.22

RFDQ

Reference Framework for the Description of Quality Approaches

2.23

RQC

Reference Quality Criteria

2.24

SCORM

Sharable Content Object Reference Model

2.25

service

intangible product that is the result of at least one activity performed at the interface between the supplier and customer

EXAMPLE Knowledge is an intangible product to be delivered.

(ISO 9000:2000)

2.26

service quality (SQ)

overall collection of implicit and explicit characteristics that the service can satisfy the customer

2.27

Total Quality Management (TQM)

management approach of an organization centered on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction, and benefits to all members of the organization and to society

2.28

W3C

World Wide Web Consortium

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3 Process model

In this section, the reference framework is described and elaborated by referring to its process model.

The process model is a framework for the description, comparison, and analysis of process-oriented quality approaches. The framework can be used as a meta-model for quality management and quality assurance approaches. This means that no assumptions and prescriptive requirements of the quality approaches are made.

The use of the framework can be described as followed:

Scenario 1: Description of a quality approach

- Select a quality management or quality assurance approach Q1.
- Identify the processes which are covered within Q1.
- Describe Q1 according to the framework using the description categories.

Scenario 2: Comparison of quality approaches

- Select quality management or quality assurance approaches [Q1..Qn].
- Identify the processes which are covered within [Q1..Qn].
- Describe [Q1..Qn] according to the framework using the description categories.
- Define a metric to compare [Q1..Qn].
- Perform analysis and comparison.

Scenario 3: Harmonization of quality approaches

- Use Scenario 2.
- Combine [Q1..Qn] towards a consensus model.

It is important to mention that the process scheme described in this working paper shall be used as a general, descriptive framework. In a second step, good practice approaches and profiles can be generated – these profiles could contain specific recommendations, guidelines, procedures, or criteria. Secondly, the process scheme can be extended and modified.

3.1 Descriptive model

The descriptive model shows the classification and documentation scheme for quality processes. It bases on the CEN/ISSS CWA 14644¹. Each process will be described by this scheme:

| Attribute | Description | Example |
|-----------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| ID | Unique Identifier | ID1234 |
| Category | Main Process | Course Development |
| Process Name | Process name | Method selection |
| Description | Description of the process | Within this process the didactic concept and methods are evaluated and selected |
| Relations | Relation to other processes | Before the method selection a target group analysis must be performed; FA.6 |
| Sub-processes / sub-aspects | Sub-processes / sub-aspects / tasks | Method identification, method alternatives, method prioritization |
| Objective | Objective of a Process | Adequate selection of one or more didactic concepts |
| Method | Methodology for this process Reference to guideline / documents | Method selection shall be based on the target group. Methods are selected based on the teachers' experience. See Method Guidelines Handbook |
| Result | Expected result of a process | Method specification Documents |
| Actors | Responsible / participating actors | Team Didactical Design |
| Metrics / Criteria | Evaluation and Metrics for this process | Criteria catalogue 3.2.2-3.2.6 |
| Standards | Standards used | DIN EN ISO 9241, IEEE 1484.12.1:2003 Learning Object Metadata |
| Annotation / Example | Further Information, Examples of usage | |

Table 1: Descriptive model for quality approaches

¹ CEN/ISSS CWA 14644 Quality Assurance and Guidelines. Brussels, 2003.

3.2 Reference Framework for Quality Descriptions (RFDQ): process model

In this section the process framework is described in the format explained in 3.1. The process model includes the relevant processes within the life-cycle of information and communication systems for learning, education, and training. The process model is divided in seven parts. Sub-processes are included referencing to a classification of processes – examples of the use of classifications are shown in Annexes B and C.

| ID | Category | Sub-Processes |
|----|---------------------------|----------------|
| NA | Needs Analysis | Classification |
| FA | Framework Analysis | Classification |
| CD | Conception / Design | Classification |
| DP | Development / Production | Classification |
| IM | Implementation | Classification |
| LP | Learning Process | Classification |
| EO | Evaluation / Optimization | Classification |

Table 2: RFDQ process model

In each part, the essential processes are described. For selected processes, examples how the reference model can be used are included; these examples are written in *italics*.

The use of the process model is shown using the classification of processes from DIN PAS 1032-1, listed fully in Annex B.

3.2.1 Process model description

In this section, the process model is described including examples for the use of each category of the description scheme.

3.2.1.1 Needs analysis

| ID | Category | Process | Description | Relation |
|-----------------------------|----------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------|
| NA | | Needs Analysis | Identification and description of requirements, demands, and constraints of an educational project | |
| Sub-processes / Sub-aspects | | NA.1 Initiation NA.2 Stakeholder identification NA.3 Definition of objectives NA.4 Demand analysis | | |
| Objective | | To describe the needs and demands leading to an educational project | | |
| Method | | <i>Quality Function Deployment</i> | | |
| Result | | Documentation of goals, objectives, needs, and requirements of an educational project | | |
| Actors | | <i>Project manager; specialists, learners, sponsors</i> | | |
| Metrics / Criteria | | <i>Indicators</i> | | |
| Standards | | ISO 9000:2000 | | |
| Annotation / Example | | | | |

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3.2.1.2 Framework analysis

| ID | Category | Process | Description | Relation |
|------------------------------------|----------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| FA | | Framework Analysis | Identification of the framework and the context of an educational process | NA, CD |
| Sub-processes / Sub-aspects | | | FA.1 Analysis of the external context FA.2 Analysis of staff resources FA.3 Analysis of target groups FA.4 Analysis of the institutional and organizational context FA.5 Time and budget planning FA.6 Environment analysis | |
| Objective | | | To describe relevant factors for an educational project | |
| Method | | | <i>Methods of empirical social research; methods in legal and economic research and analysis</i> | |
| Result | | | Documentation and validation of relevant parameters | |
| Actors | | | <i>Project manager; specialists</i> | |
| Metrics / Criteria | | | <i>Check for plausibility; consultation of additional experts</i> | |
| Standards | | | | |
| Annotation / Example | | | | |