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Information technology — Software product evaluation —

Part 5:
Process for evaluators

Technologies de l'information — Évaluation du produit logiciel —

Partie 5: Procédés pour les évaluateurs

Reference number
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Contents

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialised system for worldwide standardisation. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organisation to deal with particular fields of mutual interest. Other international organisations, 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. 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.

International Standard ISO/IEC 14598-5 was prepared by Joint Technical Committee ISO/IEC JTC1, *Information technology*, Subcommittee SC 7, *Software engineering.*

ISO/IEC 14598 consists of the following parts, under the general title *Information Technology - Software product evaluation* :

- *Part 1: General overview*
- *Part 2: Planning and management*
- *Part 3: Process for developers*
- *Part 4: Process for acquirers*
- *Part 5: Process for evaluators*
- *Part 6: Evaluation modules*

Annex A forms an integral part of this part of ISO/IEC 14598. Annexes B, C, D, E and F are for information only.

Introduction

Software products are becoming more and more important in all domains of industry and services. It is therefore necessary to be able to evaluate the quality of these software products.

Software products are extremely varied. They are produced to fulfil very diverse requirements in terms, for example, of functionality. Their context for use can also be very varied such as in the case of application software in a management information system, of software embedded in other products or of game software, to cite a few examples.

Potential benefits from evaluation are:

- the developer can use the results of the evaluation of its product to identify corrective actions, in order to improve the product or to make decisions about the evolution strategy for the product;
- for the supplier of a product the benefit from an evaluation can be to get confidence in the value of the product; in addition the evaluation report can be used for commercial purposes;
- for software product acquirers, evaluation results may be used as objective data on which to base acquiring decisions;
- for the industry at large, the spread of software product evaluation will help the use of quality as a marketing argument.

The primary purpose of software product evaluation is to provide quantitative results concerning software product quality that are comprehensible, acceptable to and can be depended on by any interested party.

The evaluation process is described as a step-wise procedure that allows expression of evaluation requirements in terms of quality characteristics as defined in ISO/IEC 9126. The evaluation takes into account various documents that can be considered as part of the software product, e.g. design documentation, test or validation reports, source code or user documentation. It is recommended that the evaluator uses a library of evaluation modules that define evaluation methods. These evaluation modules could be standardised, although no provision for that is proposed in this standard. The evaluation leads to the production by the evaluator of an evaluation report.

This evaluation process is a generic abstract process that follows the model defined in ISO/IEC 9126. Therefore, this process is applicable within all primary life-cycle processes defined in ISO/IEC 12207. Specific supporting life-cycle processes defined in ISO/IEC 12207 are directly related to the evaluation process. They are quality assurance, verification, validation, joint review and audit.

The tailoring process defined in ISO/IEC 12207 is built in the evaluation process defined in this standard by allowing the user to specify and design the evaluation activities.

The evaluation process described here may be used to test the conformity to standards such as ISO/IEC 12119.

Information technology — Software product evaluation — Part 5: Process for evaluators

1 Scope

This part of ISO/IEC 14598 provides requirements and recommendations for the practical implementation of software product evaluation when several parties need to understand, accept and trust evaluation results. In particular, it may be used to apply the concepts described in ISO/IEC 9126.

The process described in this part of ISO/IEC 14598 defines the activities needed to analyse evaluation requirements, to specify, design and perform evaluation actions and to conclude the evaluation of any kind of software product.

The evaluation process may be used to evaluate already existing products, provided the needed product components are available, or to evaluate products in development.

> NOTE For the evaluation of a product in development, the evaluation process needs to be synchronized with the software development process and product components are evaluated as they are delivered.

This part of ISO/IEC 14598 may be used by

- testing laboratory evaluators, when providing software product evaluation services,
- software suppliers, when planning evaluation of their products, including evaluation to be carried out by independent testing services,
- software acquirers, when requesting evaluation information from a supplier or testing service,
- software users when evaluating products or when using evaluation reports provided by testing laboratories,
- certification bodies in defining new certification schemes for software products.

2 Conformance

Because of the freedom of choice afforded to the user by the general nature of its recommendations, a simple claim of compliance with this part of ISO/IEC 14598 is not valid. Any organization imposing this part of ISO/IEC 14598 as a condition of trade is responsible for specifying and making public a set of requirements which constitute the terms for compliance for a given application of this part of ISO/IEC 14598. All requirements of clause 6 should be considered for applicability.

3 Normative references

The following standards contain provisions, which through reference in this text, constitute provisions of this part of ISO/IEC 14598. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 14598 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 9126:1991, *Information technology — Software product evaluation — Quality characteristics and guidelines for their use.*

ISO/IEC 14598-1:—[1)], *Information technology — Software product evaluation — Part 1: General overview.*

ISO/IEC 14598-6:—[1)], *Information technology — Software product evaluation — Part 6: Evaluation modules.*

4 Definitions

For the purposes of this part of ISO/IEC 14598, the following definitions apply.

4.1 evaluation method: a procedure describing the action to be performed by the evaluator in order to obtain the result for the specified measurement or verification applied on the specified product components or on the product as a whole.

4.2 evaluation report: the document that presents evaluation results and other information relevant to an evaluation.

4.3 evaluation records: documented objective evidence of all activities performed and of all results achieved within the evaluation process.

4.4 evaluation requester: the person or organisation that requests an evaluation.

4.5 evaluation tool: an instrument that can be used during evaluation to collect data, to perform interpretation of data or to automate part of the evaluation.

NOTE Examples of such tools are source code analysers to compute code metrics, CASE tools to produce formalised models, test environments to run the executable programs, checklists to collect inspection data or spreadsheets to produce syntheses of measures.

4.6 evaluator: the organisation that performs an evaluation.

NOTE An evaluator may, for example, be a testing laboratory, the quality department of a software development organisation, a government organisation or a user.

4.7 software product developer: the person or organisation that manufactures a software product.

1) To be published.

4.8 software product evaluation: technical operation that consists of producing an assessment of one or more characteristics of a software product according to a specified procedure.

NOTE 1 This definition can be compared to that of testing in ISO/IEC Guide 2. However, in this part of ISO/IEC 14598, the term evaluation is preferred in order to avoid confusion with the notion of testing widely accepted in the field of software engineering.

NOTE 2 Software product evaluation is not necessarily conformity testing (as defined in ISO/IEC Guide 2, 13.3.2) in the context of a certification scheme. However, conformity testing can be part of an evaluation.

5 Evaluation Concepts

5.1 General aspects

The quality of software products can be described in terms of quality characteristics as defined in ISO/IEC 9126. However, the state of the art in software measurement is such that, in general, the direct measurement of these characteristics is not practical. What is possible is to assess these characteristics based on the measurement of lower abstraction attributes of the product.

In this context, the evaluator can use his or her experience in software engineering to make the assessment. This might reduce the objectivity of the evaluation. Another aspect to be considered is the possibility of using non-deterministic evaluation methods; although precisely defined, such a method can require the evaluator to make choices which cannot be pre-defined.

NOTE An example of a non-deterministic evaluation method is the one that consists of translating a specification component of the product into a formal model and of performing performance or reliability evaluation of this model; the translation phase involves many choices to be made by the evaluator.

Therefore, provisions in this part of ISO/IEC 14598 are provided to maintain the level of objectivity of evaluation as high as possible in all circumstances. These provisions bear on the organisation of reviews of intermediate and final evaluation results and the keeping of records of the evaluation process.

5.2 Evaluation starting point

5.2.1 Initial agreement

The evaluation of a software product occurs when the requester of the evaluation requests the evaluator to perform an evaluation of this software product.

NOTE When requesting the evaluation, the requester expresses evaluation requirements which are analysed by the evaluator. The requester and the evaluator subsequently agree on the evaluation specification.

5.2.2 Parties involved in the evaluation

Potential requesters of evaluations are, for example,

- software developers,
- software suppliers,
- software acquirers,
- software users,
- system integrators in their role of software acquirers.

Potential evaluators are, for example,

- third party testing laboratories,
- testing entities within software producing or distributing organisations,
- testing entities within software buying or using organisations,
- testing entities within system integration organisations,
- organisations making comparisons between products.

In some cases, the developer of the software product is involved in the evaluation even if the developer is not the requester of the evaluation.

5.3 Characteristics of the evaluation process

A principal objective of the evaluation process described in this part of ISO/IEC 14598 is to promote the following desirable evaluation process characteristics:

- repeatability: repeated evaluation of the same product to the same evaluation specification by the same evaluator should produce results that can be accepted as being identical,

- reproducibility: evaluation of the same product to the same evaluation specification by a different evaluator should produce results that can be accepted as being identical,

- impartiality: the evaluation should not be biased towards any particular result,

- objectivity: the evaluation results should be factual, i.e. not coloured by the feelings or the opinions of the evaluator.

NOTE Evaluations of the same product can be conducted with different evaluation specifications. They are therefore not comparable and may lead to different results.

5.4 Evaluation process

The evaluation process (see clause 6) consists of a set of activities which are conducted in co-operation with the requester and the evaluator. These activities are performed on the basis of data provided by the requester and the evaluator or produced by other activities. They produce data which is used by other activities or which is the result of the evaluation process.

The activities are designed to take into account the following issues:

- objectives vary from one evaluation case to another since software products are developed to fulfil varied requirements and an evaluation requester may agree particular evaluation requirements (see 6.2.1),
- software products are composed of components, the form and nature of which depend on development methods which can be very different,
- possible evaluation techniques are numerous and need to be selected taking into account the objectives of the evaluation and the composition of the product.

All these considerations impose a high flexibility for the process.

5.4.1 Evaluation activities

The evaluation process (see clause 6) comprises the five activities listed below:

- establishment of evaluation requirements (see 6.2.1);
- specification of the evaluation based on the evaluation requirements and on the description of the product provided by the requester (see 6.3.1);
- design of the evaluation which produces an evaluation plan on the basis of the evaluation specification; this activity takes into account the components of the software product to be evaluated and the evaluation methods proposed by the evaluator;
- execution of the evaluation plan which consists of inspecting, modelling, measuring and testing the products and its components according to the evaluation plan; these actions can be performed using software tools (which are usually provided by the evaluator); the actions performed by the evaluator are recorded and the results obtained are put in a draft evaluation report;
- conclusion of the evaluation, which consists of the delivery of the evaluation report and the disposal by the evaluator of the product evaluated as well as its components when they have been transmitted independently.

5.4.2 Input to the evaluation process

The requester provides the requester’s requirements which are an initial version of the evaluation requirements.

The requester provides, during the evaluation, the following input to the evaluation process:

- the product description,
- the product components.

The product description identifies the software product as well as its components submitted for evaluation.

NOTE 1 The product may include documents related to planning, process or development methods used for its production. A planning document may include schedule, organisation structure or estimated costs.
NOTE 2 If the requester is a user, he or she should agree with the developer to support the evaluator and may require the developer to deliver to the evaluator the description of the software component and software product to be evaluated.

The evaluator provides the following input to the evaluation process:

- pre-defined evaluation specifications,
- evaluation methods and
- evaluation tools.

5.4.3 Output of the evaluation process

During the evaluation process, the evaluator provides the following output products:

- evaluation records, including evaluation plan and records of evaluation actions,
- the draft evaluation report, including evaluation requirements, evaluation specification and synthetised evaluation results,
- the reviewed evaluation report.

The evaluation requirements, specification and plan are the intermediate products of the evaluation process. The evaluation records and evaluation report are the final products of the evaluation process.

The evaluation requirements describe the objectives of the evaluation; in particular, quality requirements for the product are described.

The evaluation specification defines all analyses and measurements to be performed on the product and on its components. The components of the product that will be analysed and measured are identified.

The evaluation plan describes operational procedures needed to implement the evaluation specification; in particular all the methods and tools to be used in the evaluation are described.

The evaluation records consist of the evaluation plan and a detailed account of actions performed by the evaluator while executing the evaluation plan; these records are kept by the evaluator.

NOTE 1 The evaluation records are kept in order to allow re-processing of the evaluation results.

The evaluation report contains evaluation requirements, the evaluation specification, results from the measurements and analyses performed and any other information necessary to be able to repeat or reproduce the evaluation. The evaluation report is first issued as a draft for review. When in final form, it is delivered to the requester.

NOTE 2 The figure below gives an overview of the process described above. The information flow between activities is identified.

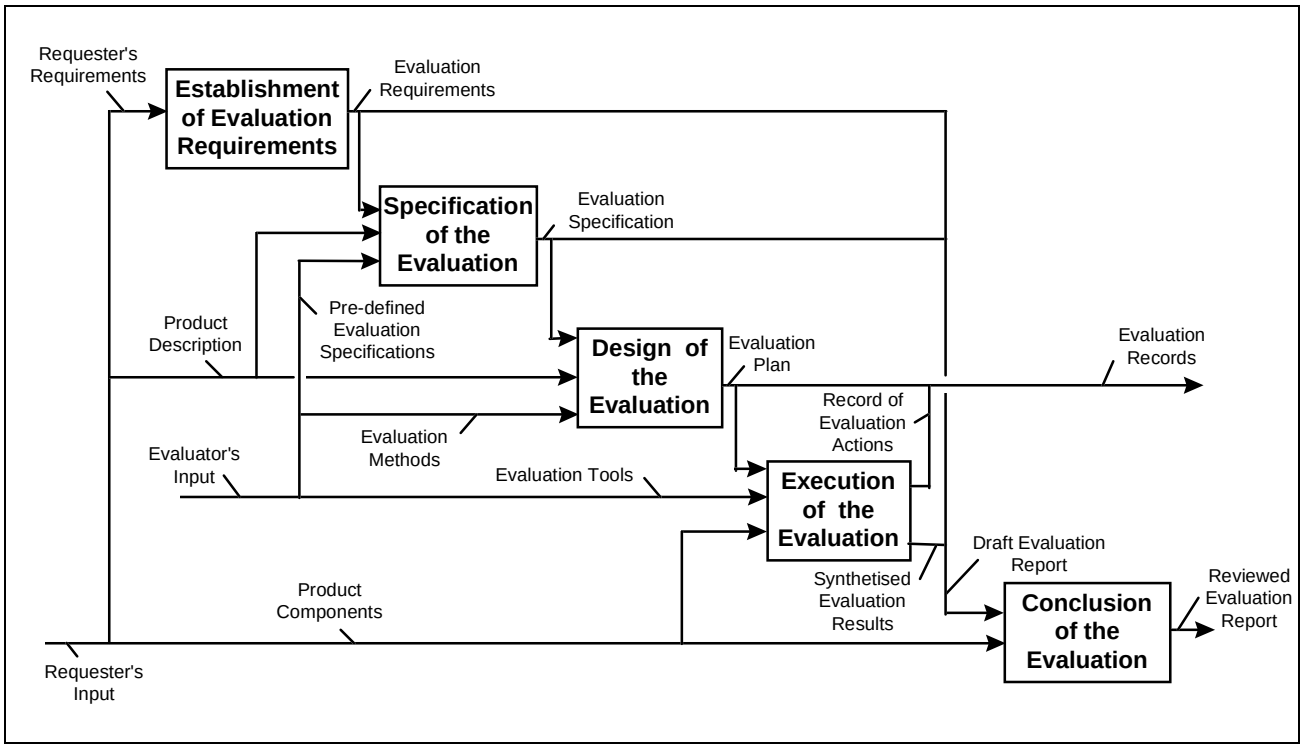

Figure 1 — The evaluation process

5.5 Relations between evaluation and life-cycle

Evaluation of a software product can be performed within the context of any life-cycle process as defined in ISO/IEC 12207. In particular, evaluation can occur within one of the acquisition, supply, development, operating or maintenance processes.

The decision as to whether a software product evaluation is to be performed may be taken as early as possible in the product development process. If this is done right at the beginning of the development process, it is possible to build into the software development process the measurements and tests to be performed for the evaluation. This would ensure the maximum likelihood for the product to satisfy all requirements concerning the evaluation results, as well as minimising the risk of extra, unexpected costs being incurred.

When the requester is the product developer, early contact with the evaluator to discuss the intention of submitting a product for evaluation would also help the developer to anticipate any special needs (such as particular documents or evidence which might be required) which the evaluators could have.

It is possible that some (or even all) of the evaluation actions will have to be done on site rather than at the evaluator’s. In this case, the actions will still be controlled by the evaluator to ensure that the results are impartial.

For very large, complex software projects it would be beneficial for the developer to have continuous, detailed co-operation with the evaluator during the whole development of the product to

minimise the duration and cost of the evaluation process. This co-operation should be such that it does not reduce the impartiality of the evaluator.

6 Evaluation process requirements

6.1 General requirements

6.1.1 Organisation and quality system

In order to satisfy the characteristics expressed in 5.3, i.e. repeatability, reproducibility, impartiality and objectivity of the evaluation results, the evaluator shall act in an organisational context that provides all necessary assurance to obtain sufficient quality for its activities. In order to satisfy this requirement, the evaluator's organisation may comply with the requirements prescribed in ISO/IEC Guide 25.

6.1.2 Requester's responsibilities

The responsibilities of the requester of the evaluation shall be

- to establish necessary legal rights in the software product for the purpose of the evaluation,
- to provide information necessary for identification and description of the product,
- to state initial evaluation requirements and to negotiate with the evaluator to determine the actual evaluation requirements; these requirements for the evaluation should comply with relevant regulations and standards,
- to state confidentiality requirements concerning the information submitted to the evaluation,
- to act, whenever necessary, as an intermediary between the developer and the evaluator,
- to provide the evaluator, whenever necessary, with suitable access to computers and other equipment used for development and for operational use of the software product,
- to provide, whenever necessary, support to the evaluator, including training and access to suitable staff,
- to ensure the timely supply, whenever necessary, of the software product, its description and components, including documentation and other material,
- to inform, whenever necessary, the evaluator of any factor that might invalidate the evaluation results.

6.1.3 Evaluator's responsibilities

The responsibilities of the evaluator shall be

- to check that the requester has the sufficient legal rights in the software product for the evaluation to be performed; to do so, the evaluator may require an attestation from the requester,
- to keep the confidentiality as required, of all the information provided by the requester, including, for example, the product under evaluation, the evaluation records and the evaluation report,
- to provide qualified and trained staff to conduct the evaluation,
- to provide the evaluation tools and technology,
- to conduct the evaluation in accordance with the evaluation requirements,
- to maintain records of any work performed during the evaluation which has an impact on the evaluation results,
- to ensure timely delivery of the evaluation report to the requester,
- to provide the visibility into the conduct of the evaluation to the extent requested by the requester.

6.2 Establishment of evaluation requirements

6.2.1 Purpose of the establishment of evaluation requirements

The purpose of the establishment of evaluation requirements is to describe the objectives of the evaluation. Such objectives relate to the software product's intended use and its associated risks (for example, see annex B). Several viewpoints may be considered: those of different product users such as the product acquirer, its supplier, its developer, its operator or its maintainer.

6.2.2 Elaboration of the evaluation requirements

The activity of analysis of the evaluation requirements is composed of the following sub-activities:

- proposing requester's requirements by the requester;
- expressing the extent of the coverage of the evaluation by the requester;
- supporting the requester in analyzing the reason for evaluation and in describing the evaluation requirements by the evaluator;
- explaining the extent of confidence and stringency of evaluation by the evaluator;
- agreeing on the evaluation requirements.

The requester of the evaluation shall provide the requester's requirements which are an initial version of the evaluation requirements. The evaluator should support the requester in analysing the reasons for evaluating the product and in describing the evaluation requirements.

The application domain for the product submitted to the evaluation should be considered, as well as the general description of its purpose. Critical issues such as safety, security, economic or environment aspects may be taken into account. Applicable regulations and laws should be considered.

In the requester's requirements, the requester shall express requirements on how extensive the coverage of the evaluation should be. At the same time the evaluator should ensure that the evaluation be stringent enough to provide real confidence in the software product quality. Therefore, the evaluator and the requester shall agree on the evaluation requirements as a pre-requisite for continuing with the evaluation process.

NOTE For certification of a software product or of its components the requester of the evaluation specifies the normative document containing the requirements for the product.

6.2.3 Contents of the evaluation requirements

The evaluation requirements shall contain a general description of the application domain for the product submitted to the evaluation. A general description of the product purpose shall be provided.

The evaluation requirements shall also consist of a list of quality requirements referring, for example, to quality characteristics as defined in ISO/IEC 9126. In this context, sub-characteristics may also be used. When a requirement refers to a characteristic not defined by ISO/IEC 9126, a reference to authoritative literature defining it shall be made and the requester and the evaluator should explicitly state their mutual understanding of this characteristic.

The relative importance of each quality characteristic in the evaluation requirements should be given. This applies when some part of the product needs to be evaluated with different evaluation requirements. To express this importance, the notion of an evaluation level as suggested in annex B may be used.

For each requirement in the evaluation requirements, the specification of information to be contained in the software product and in its components to be evaluated shall be provided. This specification should, as much as possible, refer to a software engineering standard. In addition, the type of formalism used in the components or the type of software development methods used to produce them may be specified.

NOTE The extent and the form of information required for the evaluation can be related to the cost of the evaluation, on the one hand, and to the importance of a specific quality requirement on the product, on the other hand.

6.2.4 Approbation and reporting

The evaluation requirements shall be approved as a result of a joint review between the requester and the evaluator.

The evaluation requirements shall be included in the evaluation report and in the evaluation records.

6.3 Specification of the evaluation

6.3.1 Purpose of the specification of the evaluation

The purpose of specifying the evaluation shall be to define the scope of the evaluation and the measurements to be performed on the product submitted for evaluation and on its various components. The level of details in the evaluation specification should be such that, on its basis, the repeatability and the reproducibility of the evaluation be ensured.

NOTE 1 The evaluation specified may be non-deterministic. In that case, it should be such that the results obtained from repeated or reproduced evaluations be consistent.

However, the evaluation specification should not contain proprietary information of the evaluator.

NOTE 2 The evaluation report, which contains the evaluation specification, is delivered to the evaluation requester who may disclose it to other parties. Therefore it would not be advisable for the evaluator to try to protect some proprietary information.

6.3.2 Elaboration of the evaluation specification

The activity of specifying the evaluation is composed of three sub-activities:

- analysing the product description,
- specifying the measurements to be performed on the product and its components,
- verifying the specification produced with regards to the evaluation requirements.

NOTE The verification sub-activity may be conducted in parallel with the others in order to identify potential problems as early as possible.

6.3.2.1 Analysing the product description

The requester shall provide a description of the product submitted for evaluation. The goal of this description is

- to allow to define the scope of the evaluation, i.e. the identification of those software product components that are to be considered as part of the product and the identification of those software product components that are not to be considered as part of the product and which are only referred to for the ease of understanding the product.

  NOTE 1 Such an identification may be based on specifying which parts of the documents belong to the product, which function is implemented or not by the product.
  NOTE 2 Defining the scope of the evaluation is important when the software product submitted for evaluation is embedded in a system consisting of hardware, other software products, networks or organisations because the separation between such products is not always obvious.

- to give to the evaluator the identification of product components submitted for evaluation, to understand their structure and to identify the information provided as well as how to access it.

This description shall contain the list of product components actually submitted for evaluation, a rationale about the structure of the product and a list of product related documents. The components listed may contain other smaller components which need not be listed. For each component and product related document in the lists, the following information shall be provided:

- description of the nature of the component,
- information about formalisms used within the component,
- information about the size of the component,
- relationship with other components,
- information about availability of the product component to the evaluator.

In any case, reference to appropriate software engineering standards should be made.

The evaluator shall check that the product description conforms to the above mentioned requirements.

The evaluator shall analyse the rationale provided as well as the description of the components in order to identify their relationship with the components identified in the evaluation requirements.

NOTE 3 In the evaluation requirements, components may be specified from a theoretical point of view, with regard to quality characteristics to be assessed. In the product description, actual components are listed. It may happen that some actual components of the product contain information that the evaluation requirements specifies as being in several components.
NOTE 4 This information is needed in order to identify which evaluation can be performed. This will be used, together with the evaluation requirements, to build the evaluation specification.
NOTE 5 The analysis of the product description may be improved by consultation with the developer of the product. This would provide an opportunity for the evaluator to establish whether an evaluation to the depth required will be possible, by performing a brief audit.

6.3.2.2 Specifying measurements

The evaluator shall allocate the evaluation requirements on the product itself and the various components identified in the product description. This should lead to a decomposition of the evaluation requirements into e.g. sub-characteristics. The result of this decomposition may be different for different components submitted for evaluation. At this stage, some components listed in the product description may not be considered further.

The evaluator shall then specify the measurements intended to be used to assess the characteristics, sub-characteristics and attributes of the product and the selected components. These specifications should be formulated as a combination of the following types of statements:

- a formalised specification of a metric to be applied on the product or on an identified set of components, together with instruction to present the resulting measures in the evaluation report,

- a reference to statements in a product component specifying software requirements that will be verified and the specification of the procedure to be used to verify these requirements,

- the specification of a requirement for the software product which is either missing in the software requirement documents or needs to be explained in more detail for the evaluation and the specification of the procedure to be used to verify this requirement,
- a reference to statements in identified standards or regulations where additional software requirements are provided and the specification of the procedure to be used to verify these requirements.

For each of these statements, reference should be made to the nature of and to the formalisms used in the components to be measured or verified.

For this task, the evaluator may use pre-defined evaluation specifications. These elementary specifications should be in the form of evaluation module specifications as recommended in ISO/IEC 14598-6.

6.3.2.3 Verifying the evaluation specification

The evaluator shall perform a verification of the evaluation specification with regard to the evaluation requirements.

The evaluator shall check that the components listed in the product description provide all the necessary information to perform the evaluation according to the evaluation requirements. The evaluator shall also verify that the measurements and verifications specified are sufficient to meet the objectives of the evaluation as expressed in the evaluation requirements.

The first check can lead to the identification of missing information in the components listed in the product description. This may be solved in one of the following ways:

- a reference to a product component containing the missing information shall be added in the product description; this means that the requester will provide this component together with the others for the performing of the evaluation;
- the objectives of the evaluation shall be reduced, which means that the evaluation requirements are revised.

The second check aims at confirming that the measurements and verifications proposed in the evaluation specification are consistent with the technical state of the art. This may be done in one of the following ways:

- by identifying relevant measurement standards,

  NOTE Such standards may be evaluation modules as prescribed in ISO/IEC 14598-6.

- by providing a detailed justification, referencing appropriate authoritative literature in the field; this justification shall be included in the evaluation specification.

6.3.3 Contents of the evaluation specification

The evaluation specification shall comprise:

- the scope of the evaluation referring to the product components as identified in the product description,
- a cross-reference between the information needed to perform the evaluation and the product components and other related documents listed in the product description,

- a specification of measurements and verifications to be performed and the references to product components on which they are to be performed,
- a mapping between the specification of measurements and verifications and the evaluation requirements together with the reference to standards or the justification for each measurement or verification listed.

6.3.4 Approbation and reporting

The evaluation specification shall be approved as a result of a joint review between the requester and the evaluator.

The evaluation specification shall be included in the evaluation report and in the evaluation records. In addition, any modification of the evaluation requirements as specified in sub-clause 6.3.2.3 shall be reported in the evaluation records.

6.4 Design of the evaluation

6.4.1 Purpose of designing the evaluation

The design of the evaluation shall document the procedures to be used by the evaluator to perform the measurements specified in the evaluation specification. The evaluator shall produce an evaluation plan that describes the resources needed to perform the specified evaluation as well as the distribution of these resources on the various actions to be performed.

NOTE 1 The resources considered here can be, for example, human resources to perform the evaluation actions, computing resources or office space.

The level of details in the evaluation plan should be such as to ensure that actions are performed in a competent way.

NOTE 2 The evaluation plan usually contains some evaluator’s proprietary know-how.

6.4.2 Elaboration of the evaluation plan

The activity of producing the evaluation plan is composed of three sub-activities:

- documenting evaluation methods and producing a draft plan,
- optimising the evaluation plan,
- scheduling evaluation actions with regard to available resources.

6.4.2.1 Documenting evaluation methods and producing a draft plan

The goal of this activity is to combine the specified measurements or verifications with the form of the various product components to be evaluated in order to document the detailed methods to be applied to implement the specified measurements or verifications on these components.

The evaluator shall analyse the technical constraints related to the measurements or verifications specified in the evaluation specification. Technical constraints may include, but are not limited to,

- the formalisms used for product components,
- the fact that product components are presented electronically or on paper,
- the existence of pre-defined evaluation methods,

  NOTE 1 Pre-defined evaluation methods may be documented in the form of evaluation module implementations as recommended in ISO/IEC 14598-6. Such evaluation module implementations should be related to evaluation module specifications used in the evaluation specification.

- the availability of tools to support evaluation techniques,
- the size of product components.

For each measurement or verification specified in the evaluation specification, the evaluator shall document the appropriate evaluation method.

When the evaluation method described is based on the use of a software tool, this tool shall be identified in the evaluation plan. Such identification shall include at least the name of the tool, its version identification and its origin (e.g. the supplier).

NOTE 2 When evaluation requirements refer to evaluation levels, informative annex B.2 provides guidance on which evaluation technique to use as a function of the evaluation level and the quality characteristic considered.

The description of the evaluation methods shall be completed by the identification of product components on which the method is to be applied.

When the evaluation specification is such that expert analysis of the measurements is required in order to interpret the results before they can be included in the evaluation report, the interpretation procedure shall be specified in the evaluation plan. This specification shall contain instructions to include significant account of the procedure performance in the evaluation records.

When planning the execution of the program for the product under evaluation, the environment needed for the execution shall be described as well as provision for its actual availability.

6.4.2.2 Optimisation of the measurements

At this stage, the evaluation methods are related to elements in the evaluation specification which are themselves related to evaluation requirements. Each of the elementary evaluation methods is planned to be applied on the various product components submitted for evaluation. It can happen that several elementary evaluation methods are to be applied to the same product component or consist of common parts.

The draft evaluation plan shall be reviewed in order to avoid duplicating evaluator actions. This is necessary in order to decrease the risk of errors and to reduce the planned evaluator effort.

6.4.2.3 Scheduling evaluation actions

Once duplications of the evaluation actions have been removed, the evaluator shall schedule the planned actions.

The evaluator shall take into account the availability of resources such as personnel, software tools and computers.

The evaluator shall agree with the requester the delivery schedule for the product and its components. The medium and format for delivery of product components as well as the number of copies shall be specified.

The requirements for meetings during the course of the evaluation shall be identified. When the requester is not the software product developer, the relations between the evaluator and the developer shall be identified. In particular, the support needed from the developer shall be specified. Such support may include, for example, training, informal discussions or office accommodation.

Access to development and operational sites, when necessary, shall be specified together with the needed resources.

6.4.3 Contents of the evaluation plan

The evaluation plan shall be composed of two parts, the documentation of the evaluation methods and the schedule of the evaluator actions.

The documentation of some evaluation method in the evaluation plan may consist of reference to private evaluator material. In that case, the evaluator should be able to justify the pertinence of the method with regard to the corresponding element of the evaluation specification and its own competence in applying the method.

6.4.4 Approbation and reporting

The evaluation plan shall be approved as a result of a joint review between the requester and the evaluator.

The evaluation plan shall be included in the evaluation records. The documentation of the evaluation methods or references to them as well as identification of the product components on which they are to be applied shall be included in the evaluation report.

6.5 Execution of the evaluation

6.5.1 Purpose of the evaluation execution

The purpose of the evaluation execution is to obtain results from performing actions to measure and verify the software product according to the evaluation requirements, as specified in the evaluation specification and as planned in the evaluation plan.

Performing these actions leads to the completion of the draft evaluation report and the evaluation records.

6.5.2 Performing the evaluator actions

In order to perform the planned actions, the evaluator shall

- manage the product components provided by the requester,
- manage the data produced by the evaluation actions (including report and records),
- manage the tools to be used to perform the evaluation actions.

In addition, provided specific provisions are made, the evaluator may:

- manage evaluation actions performed outside the evaluator's premises,
- manage the requirements implied by the use of specific evaluation techniques.

6.5.2.1 Management of the product components

The requester should deliver the product components and product related documents to the evaluator according to the schedule defined in the evaluation plan.

The evaluator shall register all the product components and product related documents. When the size and complexity of the product justifies it, formal configuration management should be used.

The registration information shall be at least:

- component or document unique identifier,
- component name or document title,
- condition of document (including especially anomalies or physical conditions),
- version, configuration and date information as provided by the requester,
- date of receipt.

The confidentiality of all the product components and product related documents shall be protected by the evaluator unless otherwise agreed with the requester.

NOTE The confidentiality requirements affect many aspects of evaluation work, including receipt, handling, storage and disposal of all the product related information.

6.5.2.2 Management of evaluation data

Performing the evaluation actions usually consists of measuring the product and its components to obtain intermediate data and to interpret these data in order to produce results to be included in the evaluation report. Intermediate data may be of varied nature such as, for example, numbers, figures, diagrams, excerpts from components or formalised models produced for the evaluation.

Confidentiality of intermediate data shall be protected in the same way as that of the original components and documents. Moreover, the evaluator shall make all the necessary effort to prevent any accidental or malevolent modification of these data. In particular, when the amount and the complexity of intermediate data is large, formal configuration management should be used to keep the consistency between intermediate evaluation results and the evaluated product.

The evaluator shall include in the evaluation records any intermediate data on which any interpretation is based. The decisions made during the interpretation process shall also be included in the evaluation records as specified in the evaluation plan.

6.5.2.3 Management of tool usage

The evaluation actions may necessitate the use of software tools to collect raw data or to perform interpretation of intermediate data.

NOTE 1 Examples of such tools are source code analysers to compute code metrics, CASE tools to produce formalised models, test environments to run the executable programs or spreadsheets to produce syntheses of measures.

When a tool is used to perform an evaluation action, reference to the tool shall be included in the evaluation report. The reference shall consist of the identification of the tool and of its supplier and the version of the tool.

A more detailed reference to the tool used shall be included in the evaluation records. It shall include the detailed configuration of the tool and any pertinent information needed to be able to repeat the evaluation action in order to obtain the same intermediate result.

NOTE 2 This repeatability requirement is stronger than the one expressed in 5.3 since it refers to intermediate results which are not included in the evaluation report.
NOTE 3 In some cases it might be pertinent to include a copy of the executable tool in the evaluation records.

The evaluator should make all necessary effort to assure that the tools used actually work as they are supposed to. The evaluator should maintain records of the actions undertaken to validate the tools which are used in the evaluation process.

NOTE 4 Such records can be based, for example, on the number of existing installation of the software or the amount of time during which the tool has been used.

The evaluator staff shall be trained to use the tools appropriately.

6.5.2.4 Site evaluation

In some cases, evaluation actions cannot be performed within the evaluator’s premises. They may be performed, for example, at the developer’s site or at a site where the software product is in operation.

When this occurs, the evaluator shall control all the evaluation actions performed. In particular the evaluator shall avoid any circumstances that would invalidate the evaluation results.

The evaluator shall make all necessary effort to ensure that the confidentiality of evaluation results and of intermediate evaluation results be kept.

6.5.2.5 Requirements on specific evaluation techniques

When the evaluation plan requires that the executable program of the product be tested, the configuration under test and the environment for testing shall be precisely recorded.

When an evaluation action requires that a document be inspected, the use of checklists is recommended.

6.5.3 Reviewing and reporting

During the execution of the evaluation, intermediate evaluation results and final evaluation results are produced. In order to achieve maximal objectivity, each evaluation action should be checked by evaluator's staff different from the one that performed the action.

All evaluation results shall be reviewed. The objective of the review depends on the nature of the evaluation action considered. The review shall be attended by at least one person not directly involved in the execution of the evaluation action concerned. The report of the review shall be included in the evaluation records.

Once reviewed, the evaluation results shall be included, as specified in the evaluation specification, in the evaluation report. Moreover, when the evaluation plan specifies so, some intermediate results or interpretation decisions shall be included in the evaluation report.

6.6 Conclusion of the evaluation

6.6.1 Purpose of the evaluation conclusion

The purpose of the conclusion of the evaluation consists of the review of the evaluation report and of the disposal of evaluation data.

6.6.2 Joint review of the evaluation report

The draft evaluation report shall be delivered to the requester of the evaluation. A joint review between the requester and the evaluator should be organised. The requester should be given the opportunity to make comments on the evaluation report. If such comments are made, they should be included in a specific chapter of the evaluation report. The evaluation report shall then be delivered to the requester.

6.6.3 Disposition of evaluation data and documents

Once the evaluation report has been formally delivered to the requester, the evaluator shall dispose of the data pertaining to the evaluation. This shall be done in the one of the following ways, depending on the type of data:

- the documents submitted to the evaluation shall be either returned to the requester or archived for a specified duration or destroyed in a secure way,
- the evaluation report and the evaluation records shall be archived for a specified duration,
- all other data shall be either archived for a specified duration or destroyed in a secure way.

When the specified archiving duration expires for some data, it shall be either archived again for a specified duration or destroyed in a secure way.

Provided the requester explicitly agrees, intermediate evaluation results may be used by the evaluator in order to study evaluation techniques and software metrics.

Annex A
(normative)
Template evaluation report

This annex gives guidance on the structure and contents of the evaluation report. It summarises the reporting requirements stated in clause 6 of this part of ISO/IEC 14598. In addition, some ancillary information is required for inclusion in the report.

The following sub-clauses describe the contents of the sections of an evaluation report.

A.1 Section 1 - Identifications

This section of the evaluation report contains identification information relative to the evaluation performed.

Identification of the evaluator

This sub-section shall contain the following information relative to the evaluator:

- name of the evaluator's organisation,
- address of the evaluator's organisation,
- location(s) where the evaluation has been carried out (if different from address above),
- name of the person responsible for the evaluation.

Identification of evaluation report

This sub-section shall contain the identification of the report :

- unique identification of the report (e.g. serial number),
- number of pages in the report.

This information shall be copied on each page of the report. Each page shall be uniquely identified, for example by using a page number.

Identification of requester and supplier

This sub-section shall contain the following information relative to the requester of the evaluation and the supplier of the evaluated software product:

- name of requester's organisation,
- address of requester's organisation,
- name of software product supplier (if different from name above),
- address of software product supplier (if different from address above).

A.2 Section 2 - Evaluation requirements

This section of the evaluation report shall contain the evaluation requirements as described in 6.2. In particular, it shall contain

- a general description of the product application domain,
- a general description of the product purpose,
- the list of quality requirements and product information evaluated, possibly including reference to quality characteristics and evaluation levels.

A.3 Section 3 - Evaluation specification

This section of the evaluation report shall contain the evaluation specification as described in 6.3. In particular, it shall contain

- the scope of the evaluation, referring to the product description; when the product description is not a publicly available document it shall be annexed to the report;
- the cross-reference between the information requested in the evaluation requirements and the product components;
- the specification of measurements and verifications,
- the mapping between the specification of measurements and verifications and the evaluation requirements.

A.4 Section 4 - Evaluation methods

This section of the evaluation report shall contain the documentation of the evaluation methods used to perform the evaluation as specified in 6.4. When the evaluation method is documented elsewhere, it is permissible to include simply a reference to that documentation.

NOTE Reference to the evaluation method will usually be used when it is a standard (evaluation module) or when it is proprietary.

For each evaluation method included here, the identification of product components on which the method has been applied shall be provided.

A.5 Section 5 - Evaluation Results

This section of the evaluation report shall contain the evaluation results as described in 6.5. In particular it shall contain

- the evaluation results themselves,
- intermediate results or interpretation decision, whenever necessary,
- reference to the tools used during the evaluation.

Annex B
(informative)
Levels of evaluation

As it seems difficult to obtain consensus on the generic specification of quality characteristics (according to the state of the art at the time of writing this document), including relation to sub-characteristics and to metrics for the case to be evaluated, evaluation requirements may specify evaluation levels for the quality characteristics selected.

Evaluation levels are to be related to software integrity levels as defined in ISO/IEC JTC1/SC7/WG9 working draft JTC1/SC7 N1287 "Information technology - Software Integrity - System and software integrity levels". If a software integrity level has been assigned to a software product submitted for evaluation, this software integrity level may be used to select evaluation requirements. In particular, the degree of rigour associated to the software integrity level may be used as a guide to select evaluation techniques.

Evaluation levels are related, on the one hand, to the importance attached by the requester to a given characteristic. The chosen level should be meaningful with regard to the assumed usage and environment of the software product (e.g. safety conditions, security constraints, economic risk, application constraints).

On the other hand, an evaluation level defines the depth or thoroughness of the evaluation in terms of evaluation techniques to be applied and evaluation results to be achieved. As a consequence evaluation at different levels gives different level of confidence in the quality of the software product. The level can be chosen independently for each characteristic.

This annex proposes four levels named A, B, C, and D. The levels constitute a hierarchy with A as the highest level and D as the lowest. At level A the most stringent evaluation techniques (taking into account reasonable amount of effort and time scale) are applied giving the highest confidence. Going down to level D gradually less stringent methods are used and consequently less effort is usually devoted to the evaluation.

The evaluation level for each software characteristic may change for different components of a large product (for instance it is likely that critical components with high reliability requirements are kept separated from the other components of a system).

The first section of this annex proposes guidance for selecting evaluation levels as function of the context of use of the product. The second one helps to select evaluation techniques.

B.1 Selection of evaluation levels

The evaluation levels may be selected independently for each of the relevant quality characteristics. When selecting the levels, several aspects should be considered. For example, important aspects are those related to safety, to economy, to security, to the environment and to the marketing of the product when appropriate.

For a relevant quality characteristic, the risks and consequences involved by the non conformity of the product to requirements relating to this characteristic, as well as benefits from high quality, should be assessed for all the relevant aspects. For some of these aspects, the tables below provides the relationship between risks and levels to be selected. When several aspects need to be considered, the most stringent level should be selected.

For the issues of economic risks and marketing benefits, the cost of the evaluation should be considered.

Safety aspects

Evaluation level	**Consequences**
level D	Small damage to property; no risk to people
level C	Damage to property; threat of injury to people
level B	Threat to human lives
level A	Many people killed

Economy aspects

Evaluation level	**Consequences**
level D	Negligible economic loss
level C	Significant economic loss (company affected)
level B	Large economic loss (company endangered)
level A	Financial disaster (company will not survive)

Security aspects

Evaluation level	**Consequences**
level D	No specific risk identified
level C	Protection against error risk
level B	Protection of critical data and services
level A	Protection of strategic data and services

Environment related aspects

Evaluation level	Consequences
level D	No environmental risk
level C	Local pollution
level B	Recoverable environmental damage
level A	Unrecoverable environmental damage

B.2 Selecting evaluation techniques from evaluation levels

In order to elaborate an evaluation specification to satisfy some evaluation requirements, it is necessary to specify metrics. Metrics are based on evaluation techniques that may be chosen according to quality characteristics and evaluation levels. In the following is proposed, for each quality characteristics in ISO/IEC 9126, a list of evaluation techniques ranked from less demanding levels to more demanding levels.

Functionality:

- functional or black box testing,
- inspection of development documentation guided by checklists,
- unit testing with test coverage criteria.

Reliability:

- verification of the use of specific programming language facilities,
- analysis of fault tolerance construct in the software design and code,
- reliability growth modelling.

Usability:

- user interface and documentation inspection,
- verification of the conformity to interface standards,
- performing usage experiments with real users.

Efficiency:

- execution time measurement,
- benchmark testing,
- analysis of the design to determine the algorithmic complexity.

Maintainability:

- inspection of development documentation guided by checklists,
- code metrics and programming rules verification,
- analysis of traceability between elements of development documentation.

Portability:

- analysis of software installation procedures,
- programming rules verification,
- analysis of software design.

Annex C
(informative)
Software product components

The list proposed below describes types of information that may be used for an evaluation. This model of information categorisation does not require a particular structure of the documentation of the software. The only requirement is that the types of information can be extracted from the evaluation entities and mapped onto the model.

Software Requirements Specification: Documentation of the essential requirements (functions, performance design constraints and attributes) of the software and its external interfaces.

Software Design Description: A representation of software created for analysis, planning, implementation, and decision making. The software design description is used as a medium for communicating software design information, and may be thought of as a blueprint or model of the system.

Program Description: Information necessary to understand the source program.

Source Program: A computer program (or code) that need to be compiled, assembled, or otherwise translated in order to be executed by a computer.

Executable Code: A computer program (or code) that can be executed directly on a computer.

User Documentation: Documentation describing the way in which a program is to be used to obtain desired results.

Software Requirements Review Report: Documentation of a review of the requirements specified for one or more software components to evaluate their responsiveness to and interpretation of the system requirements and to determine whether they form a satisfactory basis for proceeding into preliminary design of the component.

Software Requirements Verification Report: Documentation of the results of evaluating the software requirements specifications to determine whether it satisfies the conditions imposed. This may be a formal proof of correctness.

Program Test Plan: A document describing the scope, approach, resources, and schedule of intended test activities. It identifies test items, the features to be tested, the testing task, who will do each task, and any risks requiring contingency planning.

Requirements Measurement Report: Documentation of metrics application to software requirements specification.

Software Design Review Report: Documentation of the results of a process or meeting during which a software design is presented to project personnel, managers, users, customers, or other interested parties for comment or approval.

Software Design Verification Report: Documentation of the results of evaluating the software design to determine whether it satisfies the conditions imposed by the software requirements specifications. This may be a formal proof of correctness.

Design Measurement Report: Documentation of metrics application to software design specification.

Unit Test Plan: A document describing the scope, approach, resources, and schedule of intended unit test activities. It identifies the features to be tested and designs the set of tests.

Program Review Report: Documentation of the process or meeting during which the source program is presented to project personnel, managers or other interested parties for comment or approval.

Program Verification Report: Documentation of program verification. It may include the formal proof of partial correctness and of termination.

Unit Test Report: A document that describes the conduct and results of the testing carried out for a test unit.

Program Measurement Report: Documentation of metrics application to programs, in particular to the source code.

Program Test Report: A document that describes the conduct and results of the testing carried out for a program.

User Documentation Review Report: Documentation of the process or meeting during which the user documentation is presented to project personnel, managers, users, customers, or other interested parties for comment or approval.

System Requirements Analysis: Documentation of results of studying user needs to arrive at a definition of system, hardware, or software requirements.

System Specification and Design: A specification document that specifies the requirements for a system; typically included are functional requirements, performance requirements, interface requirements, design requirements, and development standards. A design document that describes the design of the system; typical contents include system architecture, control logic, input/output formats, and interface descriptions.

System Manuals: Set of manuals including installation manual, diagnostic manual, operator manual, support manual, etc.

System: A collection of components organised to accomplish a specific function or set of functions. It may include both hardware and software components.

System Review Report: Includes system requirements review documents and system design review documents.

System Verification Reports: Includes system requirements verification report and system design verification report.

System Test Plan: A document describing the scope, approach, resources, and schedule of intended test activities. It identifies test items, the features to be tested, the testing tasks, who will do each task, and any risks requiring contingency planning.

System Test Report: A document describing the result of testing the complete, integrated system.

Description of Software Specification Methods and Tools: Documents describing the methods and tools used to specify the software.

Description of Design Methods and Tools: Documents describing the methods and tools used to design the software.

Description of Programming Languages and Compilers: Documents identifying the programming languages (in particular the specific dialects used) and the compilers used to develop the software.

Software Development Plan: A document that describes the technical and management approach to be followed for the software development project. The plan typically describes the work to be done, the resources required, the methods to be used, the procedures to be followed, the schedules to be met and the way that the project will be organised.

Quality Assurance Plan: A document that describes all actions necessary to provide adequate confidence that a software item or product conforms to established technical requirements.

Configuration Management Plan: A document that clearly states the actions to be performed by software engineering and supporting activities that are required to maintain visibility of the evolving configuration of the computer program product. The plan supports management in the process of evaluating and implementing changes to each configuration and assures that the changes are properly and completely incorporated into each computer program product.

Software Development Report: A document that contains records of project activities and changes to activities described in the software development plan.

Quality Assurance Report: A document that contains records of quality assurance activities and changes with respect to the quality assurance plan.

Configuration Management Report: A document that contains records of configuration management activities. It includes configuration control information.

Figure C.1 summarises the categorisation of information proposed.

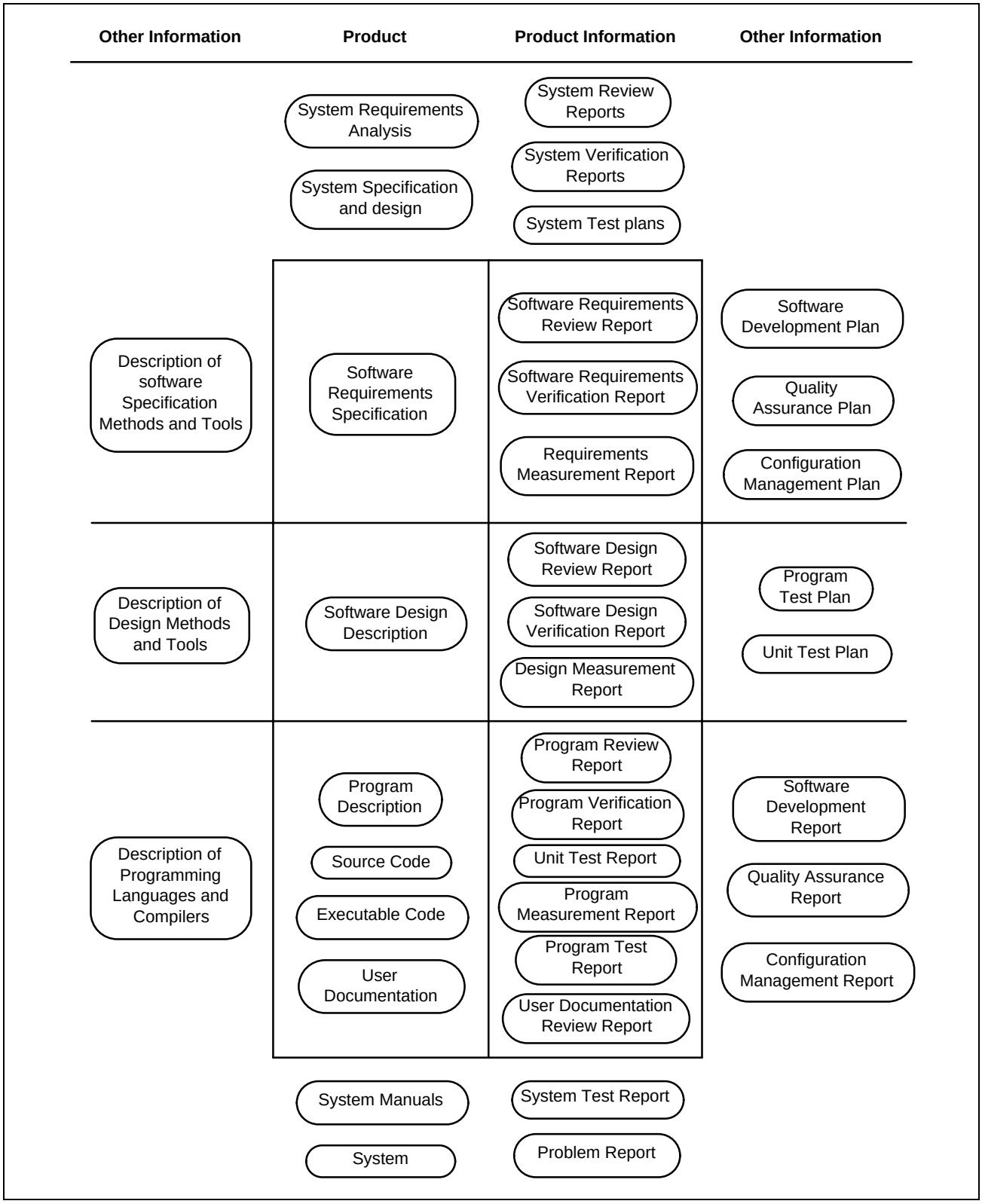

Figure C.1 — Categorisation of information

Annex D
(informative)
Interactions between requester and evaluator

The requester of the evaluation and the evaluator interact during the evaluation process. The process is divided into elementary and sequential interactions that may be implemented as individual contracts. Both parties have a number of opportunities to terminate the interaction, remaining liable for the stages which have been completed but without incurring any further obligation.

The following procedural interaction should take place:

Interaction step 1: The requester indicates the **evaluation requirements** and these are accepted by the evaluator.

The product is described and identified, and the level of evaluation is agreed. The requester agrees to supply required materials. The evaluator's acceptance of the requester's requirements may occur after a course of negotiations, the requirement being that there should be some clearly identifiable document or documents which contain the agreed requirements.

Interaction step 2: Upon agreement of these matters, the evaluator will offer to produce an **evaluation specification** upon delivery of specified items of product information. The requester may accept this offer or withdraw from the evaluation process. Assuming that the requester agrees and supplies the agreed materials and information, the evaluation specification is produced and supplied to the requester who may accept or reject its provisions.

Interaction step 3: If the specification is accepted the evaluator will offer to produce an **evaluation plan** on the basis of the provisions contained in the evaluation specification. This offer may be accepted by the requester or rejected. If it is rejected, this terminates the evaluation process. Otherwise, the evaluation plan is produced and supplied to the requester.

Interaction step 4: Based on the evaluation plan the evaluator might offer to **conduct an evaluation** according to it, and produce an evaluation report. Once again, the evaluator's offer will require acceptance by the requester. Assuming that the evaluator's offer is accepted, the evaluation is conducted. The requester should carefully review this offer to determine if any attempt has been made to prevent him from questioning the evaluation results (e.g. exclusion clauses). If found the requester should request that such restriction be removed.

Interaction step 5: The **evaluation report** is delivered to the requester. The contents of such a report is specified in annexe A of this standard. The evaluation report may be accepted by the requester or an appeal may be lodged against any of the evaluator's findings or actions. ISO IEC Guide 25 provides that the evaluator should have a defined complaint procedure. This could be dealt with in the general terms and conditions document and should identify the issues which may be the subject matter of an appeal, the procedures which will be followed and any consequences in terms of cost which may arise pursuant to an appeal.

In the context of conformance testing, the negotiation in step 1 is limited to the acceptation or the rejection of standard evaluation requirements.

D.1 Analysing evaluation requirements

The agreement of the evaluation requirements constitutes the first formal stage in the parties' relationship. It may be expected that an agreement will be reached after a prolonged period of negotiations. Normally the requirements document will supersede any earlier communications although these may serve as the basis for an action alleging e.g. misrepresentation or lack of goodwill.

D.2 Specifying the evaluation

This stage may involve negotiation between the parties. Ultimately, however, the evaluator may offer to prepare an evaluation plan on the basis of the terms and conditions contained in the evaluation specification.

Two sets of terms may be identified. First, the evaluator will wish to establish a set of common rules and procedures which will govern all of their evaluations and all of their dealings with the requesters. Second, specific provisions will be required to deal with the particular contract involved. The optimum approach from the evaluator's standpoint would be located the general terms separately and incorporate a provision in every evaluation specification, evaluation plan and any other communication with the requester which may possess contractual significance stating that any agreement is subject to the general terms.

D.3 Designing the evaluation

The requester requests the production of an evaluation plan. This act constitutes the requester's acceptance of the evaluator's offer to draw up the evaluation plan subject to the terms and conditions specified in the evaluation specification. The evaluation plan may restate many of the provisions of the evaluation specification but will also:

(i) identify specific evaluation modules to be applied,

(ii) prescribe a timetable for the evaluation process,

(iii) provide for the logistics of the evaluation process.

The evaluator may offer to perform an evaluation according to the evaluation plan.

D.4 Performing the evaluation

The evaluation may be expected to follow the evaluation specification and plan. From the legal standpoint, attempt must be made to identify and provide for potential problems. The most significant problem would be that the evaluation plan proves to be non implementable. This may be caused by a number of factors or circumstances including the possibilities that:

(i) deficiencies appear in the evaluation plan,

(ii) the software may not be as specified,

(iii) third party intervention may prevent performance.

Annex E
(informative)
Evaluation contract

E.1 Model contract

The scheme described in the preceding section involves a number of separate contracts. These link with and build into each other so that by the stage of agreement on the evaluation plan a complete relationship has been defined. The key components are the:

(i) evaluation requirements,

(ii) evaluation specification,

(iii) evaluation plan, and

(iv) general terms and conditions.

Within this structure, the following components can be identified

A. Specification of the Evaluation

(i) identification of the parties

(ii) identification of the product

(iii) purpose of the agreement

(iv) identification of evaluation techniques.

B. Conduct of the Evaluation

The requester’s obligations are

(i) provisions regarding delivery of software and associated information.

The testing laboratory’s obligations include

(i) duration of evaluation,

(ii) qualifications of evaluation staff, and

(iii) conduct of the evaluation.

C. The Evaluation Report comprises

(i) presentation of the results/format of the evaluation report,

(ii) dispute resolution procedures,

(iii) use to which the report may be put, and

(iv) resubmission of products/testing of new versions.

D. General Legal Terms and Conditions consist of

(i) confidentiality,

(ii) intellectual property issues,

(iii) exclusion/limitation clauses, and

(iv) choice of law/jurisdiction.

E.2 General legal terms and conditions

A number of legal provisions will be relevant throughout the stages of the requester-testing laboratory relationship outlined above. These would include issues concerned with intellectual property rights in the software, confidentiality of information, exclusion or limitation clauses, choice of law clauses, interpretation clauses.

Application of Terms: No variation to these general terms or conditions will be valid unless made in writing and signed by an authorised employee or officer of the testing laboratory.

Where provisions of national law render any of these terms unenforceable or illegal, such terms shall be severed from the remainder of the agreement.

The provisions of these general terms together with the evaluation specification and evaluation plan will constitute the complete contract between the testing laboratory and the requester and will supersede any earlier agreement or any representations made by or on behalf of the testing laboratory.

Confidentiality: The testing laboratory undertakes to take all reasonable steps to maintain the physical security of any property of the requester which is in its custody or control as part of the evaluation procedure. The testing laboratory also undertakes to treat as confidential any information supplied as part of the evaluation procedure and to impose similar obligations upon their employees or any other party to whom the information may be divulged for the purpose of evaluation.

Use of Intellectual Property Rights: The testing laboratory is granted a non-exclusive license by the requester to use the software for testing purpose. Such use may in particular include the acts of *<specify any forms of analysis that will be required as part of the evaluation procedure>*.

Limitation of Liability: There are no warranties, expressed or implied by the testing laboratory to the requester or to any other party concerning the quality of the evaluated software or for its fitness for any particular purpose.

In the event of negligent performance of its duties, the liability of the testing laboratory will be limited to the amount of the evaluation fee. In no event will the testing laboratory

be liable for any lost profits or consequential loss arising out of the negligent performance of its duties.

Force Majeure: In the event that the operation of circumstances outside the control of the testing laboratory or the requester renders impossible the fulfilment of any of the obligations imposed under the evaluation contract, no liability will arise.

Use of Evaluation Results: The evaluation report may be used by the requester for the purpose of obtaining a certificate of conformity with <*specify form of certification - check with global approach*>. The report may also be used for such other purposes as the requester may wish subject to the condition that the report may not, without the consent of the testing laboratory be reproduced other than in full.

Use of Quality Labels: In the event that the product is evaluated as conforming to the relevant evaluation level, the testing laboratory, as proprietor of quality label, will grant a non-exclusive license to the requester of an evaluated product to attach the mark to products or packaging. Nothing must be done to suggest that the product concerned has been approved by the testing laboratory.

Validity of Evaluation: The evaluation will be valid for an initial period of 12 months.

Evaluation Data: Data acquired during the evaluation process relating to the product will be retained by the testing laboratory during the period of validity of the evaluation. The data will be treated as confidential and not disclosed without the consent of the requester or in accordance with the requirements of a court of law. At the expiry of the evaluation's validity the data will be destroyed.

All products and materials supplied by the requester will be returned at the expiry of the evaluation process.

Annex F
(informative)
Bibliography

ISO/IEC 2382-1:1993, *Information technology - Vocabulary - Part 1: Fundamental terms.*

ISO/IEC 2382-20:1990, *Information technology - Vocabulary - Part 20: System development.*

ISO 8402:1994, *Quality management and quality assurance- Vocabulary.*

ISO/IEC Guide 2:1996, *Standardization and related activities - General vocabulary.*

ISO/IEC Guide 25:1990, *General requirements for the competence of calibration and testing laboratories.*

ISO 9001:1994, *Quality systems - Model for quality assurance in design, development, production, installation and servicing.*

ISO/IEC 12207: 1995, *Information technology - Software life cycle processes.*

ISO/IEC 9126-1:—[1)], *Information technology - Software quality characteristics and metrics - Part 1: Quality characteristics.*

NOTE Work in progress. This document will replace ISO/IEC 9126: 1991.

ISO/IEC 14598-2:—[1)], *Information technology - Software product evaluation - Manager's guide.*

ISO/IEC JTC1/SC7 N1056, *Working Glossary for SC7.*

ISO/IEC JTC1/SC7/WG9 working draft JTC1/SC7 N1287 *Information technology - Software Integrity - System and software integrity levels.*

ISO/IEC 12119:1994, *Information technology - Software packages - Quality requirements and testing.*

Commission of the European Communities, DG XIII, *ITSEC - Information Technology Security Evaluation Criteria*, version 1.2, June 1991, ISBN 92-826-3004-8.

Commission of the European Communities, DG XIII, *ITSEM, Information Technology Security Evaluation Manual*, version 1.0, September 1993, ISBN 92-826-7087-2.

ISO/IEC JTC1/SC21/WG9 N 12 Rev: February 1994, *Proposed draft technical report - interpretation of accreditation requirements in ISO/IEC Guide 25 for Information Technology and Telecommunications testing laboratories for software and protocol testing services.*

1) To be published.

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