INTERNATIONAL STANDARD

ISO/IEC 14598-2

First edition
2000-02-01

Software engineering — Product evaluation —

Part 2: Planning and management

Ingénierie du logiciel — Évaluation du produit — Partie 2: Planification et gestion

Reference number
ISO/IEC 14598-2:2000(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 734 10 79
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

Contents

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. 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 14598-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software engineering*.

ISO/IEC 14598 consists of the following parts, under the general title *Software engineering — 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: Documentation of evaluation modules*

Annex A forms a normative part of this part of ISO/IEC 14598.

Introduction

This part of ISO/IEC 14598 provides details about the planning and management requirements which are associated with software product evaluation.

While this part of ISO/IEC 14598 is mainly concerned with product evaluation, wherever it is relevant the corresponding process evaluation activities are also discussed.

This part of ISO/IEC 14598 aims to clarify the requirements which should be provided by the organisation in order to ensure the success of the evaluation. This supporting function can be part of the organisation (e.g. a Technical Group), or a specially created management function.

Software engineering — Product evaluation —

Part 2:
Planning and management

1 Scope

This part of ISO/IEC 14598 provides requirements, recommendations and guidelines for a supporting function which is responsible for the management of software product evaluation and for technologies necessary for software product evaluation.

The role of the supporting function includes motivating people and training them for the evaluation activities, preparing appropriate evaluation documents and methods, and responding to queries on evaluation technologies.

Main targets for evaluation support are software development, system integration and maintenance, including software acquisition, at both project and organisation levels.

Technology management is related to the planning and management of a software evaluation process, metrics and tools. This includes the management of development, acquisition, standardisation, control, transfer and feedback of evaluation technology experiences within the organisation.

The intended users of this part of ISO/IEC 14598 are people who are responsible for

- managing the use of the evaluation technology,
- supporting software product evaluation,
- managing software development organisations,

or people in a quality assurance function. However, it is also applicable to managers involved in other software related activities.

2 Conformance

In order to conform to this part of ISO/IEC 14598, an organisation shall review all requirements and recommendations in clause 6, to identify those which are applicable, and state which requirements and recommendations have not been implemented.

3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 14598. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, 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 normative documents indicated below. For undated references, the latest edition of the normative documents referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

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

ISO/IEC 9126-1, *Information technology — Software product quality — Part 1: Quality model.*

ISO/IEC 9126-2, *Information technology — Software product quality — Part 2: External metrics.*

ISO/IEC 9126-3, *Information technology — Software product quality — Part 3: Internal metrics.*

ISO/IEC 14598-1:1999, *Information technology — Software product evaluation — Part 1: General overview*.

ISO/IEC 14598-5:1998, *Information technology — Software product evaluation — Part 5: Process for evaluators*.

ISO/IEC 14598-6, *Software engineering — Product evaluation — Part 6: Documentation of evaluation modules*.

4 Terms and definitions

For the purposes of this part of ISO/IEC 14598, the terms and definitions given in ISO 8402 and ISO/IEC 14598-1 and the following apply.

4.1
evaluation technology (technology used for evaluation)
techniques, tools, metrics, measures and other technical information, used for evaluation

4.2
supporting function
an organisation responsible for assisting the software evaluation activities through the provision of technology, tools, experiences, and management skills

4.3
techniques
methods and skills required to carry out a specific task

5 Evaluation management concepts

This part of ISO/IEC 14598 is applicable to the supporting function, which provides the organisation-wide support to all projects in software development, software acquisition and third party evaluation organisations (see tables 1 and 2).

Table 1 — Software evaluation activities

DEVELOPED SOFTWARE		ACQUIRED SOFTWARE	
Development Activities	Evaluation Activities	Acquisition Activities	Evaluation Activities
The "deliverables" are dependent upon the chosen life cycle e.g. System Requirements Specification, Systems Design Specification	Evaluation of specific "deliverables" (output of the project) e.g. Review System Design	Dependent upon the selected acquisition process e.g. Request for proposal; Suppliers process	Review specific output of the acquisition process Review proposal request Audit supplier's process

The main role of the supporting function should include

- acquisition of relevant international and national standards, technical information and, if required, expert support,
- development of suitable in-house standards and tools based upon the project's and organisation's requirements,
- development of criteria for setting benchmarks for the evaluation,
- reviewing the effectiveness and quality of any software acquisition and development,
- collection and analysis of evaluation results and the dissemination of these within the organisation by the use of a database,
- facilitation of technology transfer, based upon the experiences within the organisation and its respective evaluation projects,
- support of evaluation projects and their respective project managers.

The supporting function can be external or internal with respect to the organisation which is evaluating the software.

If the supporting function is an internal part of the evaluating organisation, it can be within or outside the department which is involved in the software evaluation. The specific roles of the supporting function and the evaluation projects are shown in table 2. This table also shows the relationship between the activities of the supporting function and the evaluation projects.

Table 2 — Relationship between supporting function and evaluation projects

SUPPORTING FUNCTION PROVIDES	EVALUATION PROJECTS DEVELOP
* NEW TECHNOLOGY * INTERNATIONAL/NATIONAL STANDARDS * EXPERTISE (CONSULTANCY) * TRAINING * ORGANISATION DATA BASE * SUPPORT TO EVALUATION PROJECTS	* PROJECT EXPERIENCE * EVALUATION EXPERIENCE * PROJECT DATA * EXPERIENCE WITH TECHNOLOGY * FEED-BACK TO THE SUPPORTING FUNCTION

6 Requirements and recommendations for supporting software evaluation

6.1 General

The organisation shall develop a policy and plans for all evaluation activities. The responsibility of the supporting function shall also be defined for all evaluation activities.

a) The following steps shall be followed when planning and executing software evaluation.

1) Define the objectives of the software evaluation.

2) Ensure that a Quantitative Evaluation Plan for all evaluation projects is developed. This plan may be subdivided into lower level plans, subject to the complexity of the respective evaluation (see Annex A).

3) Enter project and/or product evaluation experiences into the organisation's database, to improve the organisation's approach to software evaluation.

b) Organisations should carry out all their software evaluations in accordance with the following:

1) evaluate whether the software conforms to international, national or internal standards (if that is applicable),

2) ensure that the evaluation results can be quantified, clearly presented and traceable,

3) ensure that suitable and effective technology and best practices are used,

4) ensure that the evaluation is carried out effectively,

5) ensure that plans and recommendations supporting all future evaluation activities are available.

6.2 Management at organisational level

Organisations that develop, acquire or evaluate software repeatedly shall have the overall evaluation responsibilities and quality assurance activities clearly defined and incorporated into a plan.

NOTE - When implemented, this plan will help to improve the quality of the evaluation and ensure the best use of the available and relevant technology.

Some organisations may choose to entrust the evaluation activities to a third party. This third party shall also manage the evaluation technology in accordance with the following requirements and recommendations.

6.2.1 Planning the use and improvement of the evaluation technology

An overall plan for improving the software evaluation and its supporting techniques shall be made and implemented.

The plan should include the following:

a) Preparation of a policy statement

There shall be a policy stating the organisation's approach to the introduction, maintenance and improvement of software quality evaluation.

b) Definition of the organisation's objectives

The organisation's objectives, which are to be achieved by the introduction, maintenance and improvement of software quality evaluation technology, shall be defined.

c) Identification of the technology to be used

The software evaluation methods and techniques used in the organisation shall be assessed and identified in the plan. Any deviation from the stated objectives shall be corrected.

d) Assignment of responsibilities for the management of the evaluation process

Clearly stated responsibility shall be assigned for the introduction, maintenance and ongoing improvement of the evaluation process.

e) Identification of further improvements

The process and activities for investigating the availability and applicability of new technology shall be identified. This includes conducting trials and evaluations, and introducing and maintaining new techniques.

6.2.2 Implementation of the evaluation technology

The organisation shall

a) assess its own and externally available quality evaluation technology and shall determine its technology needs and, if necessary, how any new technology can be acquired,

b) clarify and define the detailed requirements for acquiring or developing the evaluation technology according to the results of the work described in a) above. These plans shall then be implemented,

c) define the process for adopting and operating the acquired evaluation technology.

Any validated evaluation module should be maintained under configuration control, and documented as an Evaluation Module (see ISO/IEC 14598-6). Otherwise it should be put into trial use for assessment.

The software evaluation process for an organisation shall be determined. If this is not available in-house, it shall be acquired.

In the case of acquisition

a) first, if international or national standards are available, the organisation should introduce these,

b) second, if well-known evaluation technology within academia or industry is available, the organisation should consider introducing these,

c) finally, the organisation should consider developing the appropriate technology or contracting an external expert agency to fulfil these requirements.

6.2.3 Transfer of technology used for evaluation

In order to transfer the developed or acquired technology within an organisation, the organisation should prepare training programmes, tools and the appropriate environment for the introduction and adoption of new technology. These programmes, tools and environment need not be uniform, but should correspond to the technology level of the project.

a) Preparation for technology transfer

The organisation should consider the following for the purpose of technology transfer:

1) prepare a Quantitative Evaluation Plan (see Annex A) to include targets, activities, schedules, project objectives and responsibilities for the technology transfer activities,

2) prepare supporting training programmes,

3) prepare tools and environment,

4) define how to collect data and assess the technology transfer,

5) define how to collect experiences about technology transfer.

b) Implementation of technology transfer

The organisation should implement the technology transfer and collect the data according to the defined plan.

c) Assessment of technology transfer

The organisation should assess the technology transfer as follows:

1) assess the effects of the introduced technology for all projects,

2) evaluate the extent to which the technology is used within the organisation.

The organisation should, if necessary, modify or prepare a new plan subject to the results of the assessment.

6.2.4 Assessment of the technology used for the evaluation

In order to achieve better results of the evaluation, the technology used shall be assessed.

The evaluation results which were obtained for a given project should be collected and assessed as follows:

a) Collection and maintenance of the information

The information about the technology necessary for the assessment should be collected, (e.g. the effort spent on measurements and evaluations). This information should be verified, selected, modified and maintained for future use by other projects and for the purpose of verifying the usefulness of the new technology.