
Information technology — Software engineering — Guidelines for the adoption of CASE tools

Technologies de l'information — Ingénierie du logiciel — Lignes directrices pour l'adoption d'outils CASE



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Foreword

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

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The main task of technical committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/IEC TR 14471, which is a Technical Report of type 2, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software engineering*.

Annexes A and B of this Technical Report are for information only.

Introduction

Historically, there have been problems experienced by organizations in adopting CASE tools. Because organizations have not gained the expected benefits of CASE technology, it is hoped that the use of a well-founded CASE adoption process will help achieve successful adoption of CASE tools.

A survey conducted by ISO/IEC JTC 1/SC 7/WG 4 offers some hope that these problems may be improving. This survey suggests that CASE tools are performing new capabilities and getting easier to use, that users' expectations are getting more sophisticated, and that CASE tools are more likely to meet their goals. However, according to the survey, there remain a number of continuing problems. There has not been sufficient attention given to pilot trials of CASE technology before using it on actual projects, and users report a need for additional top management support, a total process for CASE adoption, and a preparation of the organization for the introduction of the technology. This Technical Report addresses the continued needs reported by users.

The purpose of this Technical Report is to provide a recommended practice for CASE adoption. It provides guidance in establishing processes and activities that are to be applied for the successful adoption of CASE technology. The use of this Technical Report will help to maximize the return and minimize the risk of investing in CASE technology. However, this Technical Report does not establish compliance criteria.

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1 Scope

Since CASE adoption is a subject of the broader technology transition problem, this Technical Report addresses the adoption practices appropriate for a wide range of computing organizations. Also, this Technical Report neither dictates nor advocates particular development standards, software processes, design methods, methodologies, techniques, programming languages, or life-cycle paradigms.

This Technical Report will:

- identify critical success factors,
- propose a set of adoption processes,
- guide successful adoption in consideration of organizational and cultural environment.

The following groups are targeted as potential audiences:

- CASE users
- information systems managers
- chief information officers (CIO)
- CASE suppliers
- software engineering consultants
- those involved in the acquisition of CASE tools and technology

This Technical Report addresses aspects of product evaluation, selection, and adoption which are specific to CASE tools. It is complementary to related ISO/IEC documents which deal with the general aspects of these topics.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Technical Report. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Technical Report 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 12207:1995, *Information technology — Software life cycle processes*.

ISO/IEC 14102:1995, *Information technology — Guideline for the evaluation and selection of CASE tools*.

3 Terms and definitions

For the purposes of this Technical Report, the following definitions apply.

3.1

Successful adoption

the extent to which the use of CASE tools can measurably meet an organization's uniquely defined adoption goals

3.2

Adoption process

the set of activities by which an organization brings CASE tools into widespread use

3.3

CASE needs

the organizational requirements which are met by CASE tool characteristics

NOTE These characteristics are detailed in Clause 9 of ISO/IEC 14102:1995. They include: management process, development process, maintenance, documentation, configuration management, quality assurance, verification, validation, environment needs, CASE tool integrability, quality characteristics, acquisition needs, implementation needs, support indicators, and certification requirements.

4 Symbols and abbreviated terms

CASE Computer aided software engineering

CIO Chief information officer

CSF Critical success factor

MIS Management information system

5 Critical success factors for adoption

One of the primary goals of this Technical Report is to identify major factors which are critical to success in CASE adoption. A comprehensive set of technical, managerial, organizational, and cultural factors should be considered in order to successfully introduce CASE technology into an organization. These factors should be monitored through the adoption processes when applicable. A cross reference table for the processes and the factors is provided in Annex B.

The critical success factors include:

Goal setting: The definition of a clear, measurable set of goals and expectations for CASE adoption, including both business and technical goals.

NOTE 1 Examples of measurable set of goals for CASE adoption might be "twenty percent increase of productivity in unit test activity", "sixteen percent improvement of quality in requirements specification activity", "fifty percent gain of reusability in object oriented design activity", "sixty percent of projects should use CASE tools", etc.

Management support: The extent to which high level management actively encourages CASE adoption, including but not limited to the willingness to allocate the necessary resources.

Tool use strategy: The definition of a clear strategy for the scope of tool use.

NOTE 2 Examples of strategy might include tool use on a specific set of application types, use by a specific business component or corporate-wide use.

Total adoption process plan: A plan and design for the total process of bringing the tool into the organizational component.