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Software engineering — Software life cycle processes — Maintenance

*Ingénierie du logiciel — Processus du cycle de vie du logiciel —
Maintenance*



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Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
1.1 Overview	1
1.2 Purpose	1
1.3 Field of application	1
1.4 Limitations	2
2 Normative references	2
3 Terms, definitions and abbreviated terms	2
3.1 Terms and definitions	2
3.2 Abbreviated terms	5
4 Conformance	5
5 Application of this document	5
5.1 General	5
5.2 Maintenance process	6
5.3 Organization of this document	6
6 Maintenance process	7
6.1 Maintenance activities and tasks	7
6.1.1 General	7
6.1.2 Maintenance strategy	9
6.1.3 Maintenance planning	10
6.1.4 Maintenance plans and procedures	10
6.1.5 Maintenance requirements review	11
6.1.6 Maintenance changes impact analysis	12
6.1.7 Maintenance measurements	13
6.1.8 Replacement elements monitoring of quality and availability	13
6.1.9 Maintenance and logistics results management	14
6.2 Problem and modification analysis	14
6.2.1 Problem and modification analysis task	14
6.2.2 MR/PR feasibility review	15
6.2.3 MR/PR replication or verification	15
6.2.4 MR/PR implementation	16
6.2.5 MR/PR reviewing and recording	16
6.2.6 MR/PR approval	16
6.2.7 MR/PR additional analysis recording	17
6.2.8 MR/PR implementation using technical processes	17
6.2.9 MR/PR review of modified system	17
6.2.10 MR/PR approval and implementation	18
7 Software disposal	18
7.1 General	18
7.2 Disposal strategy	19
7.2.1 General	19
7.2.2 Disposal strategy items	19
7.2.3 Disposal tasks	19
7.2.4 Disposal notification	19
7.2.5 Disposal notification tasks	19
7.2.6 Post-disposal tasks	20
7.2.7 Archiving records	20
8 Implementation considerations	20
8.1 General	20
8.2 Types of maintenance	21

8.3	Agreements for maintenance	21
8.4	Tools for maintenance	22
8.5	Software maintenance measurement	22
8.6	Definition of process	23
8.7	Early involvement in development	23
8.7.1	General	23
8.7.2	Maintenance organization functions	23
8.7.3	Maintenance organization involvement	23
8.8	Applying life cycle processes to strengthen maintainability	23
8.8.1	General	23
8.8.2	Maintainability and the technical processes	24
8.8.3	Maintainability and specific activities in the technical processes	24
8.9	Records and information items	29
9	Software maintenance plan	30
9.1	General	30
9.1.1	Overview	30
9.1.2	Identification and control of the plan	30
9.1.3	Scope of maintenance	30
9.1.4	Designation of maintenance organization	31
9.1.5	References	31
9.1.6	Definitions	31
9.1.7	Processes	31
9.1.8	Organization and maintenance activities	32
9.1.9	Resources	33
9.1.10	Estimate of maintenance costs	33
9.1.11	Training	34
9.1.12	Software maintenance control requirements	34
9.1.13	Maintenance records and reports	34
9.2	Resource analysis	34
9.2.1	General	34
9.2.2	Personnel resources	35
9.2.3	Environment resources	35
9.2.4	Financial resources	35
	Bibliography	36
	IEEE Notices and Abstract	37

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO/IEC documents should be noted. This document was drafted in accordance with the rules given in the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

ISO/IEC/IEEE 14764 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Systems and software engineering*, in cooperation with the Systems and Software Engineering Standards Committee of the IEEE Computer Society, under the Partner Standards Development Organization cooperation agreement between ISO and IEEE.

This third edition cancels and replaces the second edition (ISO/IEC 14764:2006), which has been technically revised.

The main changes compared to the previous edition are as follows:

- alignment of the standard with ISO/IEC/IEEE 12207:2017 and updates to other ISO/IEC JTC1/SC7 standards;
- introduction of modern approaches to “maintenance”.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

Introduction

This document provides guidance on the software maintenance process. Maintenance is a technical process in the life cycle of a software product, as described in ISO/IEC/IEEE 12207. The maintenance process contains the activities and tasks of the maintenance organization. This document is the result of the harmonization of ISO/IEC 14764 and IEEE Std 1219, and the update for ISO/IEC/IEEE 12207:2017.

Because maintenance consumes a major share of a software life cycle financial resources, it should be an important project consideration.

During operation of the software, problems may be detected that were not detected during verification, validation and acceptance. Therefore, a maintenance effort is needed to cope with these problems. This maintenance effort also covers software improvements needed to meet new or modified user requirements. Software maintenance is commonly needed when upgrading system components, such as operating systems and databases, as well as when changes are made to external software and systems' interfaces. Software maintenance is typically a significant portion of life cycle costs, even when a part of the system under maintenance includes COTS software.

Software maintenance organizations use a number of specific tools, methods, and techniques. This document does not specify how to implement or perform the activities and tasks in the software maintenance process since these are dependent upon the formal agreement and organizational requirements. Maintenance is required on all types of software, whatever the technology, technique, or tool used to create it.

Software engineering — Software life cycle processes — Maintenance

1 Scope

1.1 Overview

This document provides guidance for the maintenance of software, based on the maintenance process and its activities and tasks defined in ISO/IEC/IEEE 12207:2017, 6.4.13. Moreover, this document describes the maintenance process in greater detail and establishes definitions for the various types of maintenance. This includes maintenance for multiple software products with the same maintenance resources. “Maintenance” in this document means software maintenance unless otherwise stated.

The document does not address the operation of software and the operational functions, e.g. backup, recovery, system administration, which are normally performed by those who operate the software. However, it does include the related disposal process defined in ISO/IEC/IEEE 12207:2017, 6.4.14.

This document is written primarily for managers, maintenance organizations, quality managers, users and acquirers of systems containing software.

Many of the activities and tasks discussed in this document apply equally to maintenance services, as well as to maintained software products. For example, in a COTS intensive system, maintenance services are performed to sustain the product in operations.

While the scope of this document is software maintenance, hardware and hardware costs are important considerations for maintenance.

1.2 Purpose

This document provides guidance on the maintenance process. It identifies how the maintenance process can be invoked during acquisition and operation. This document also emphasizes the following in the maintenance process: the maintainability of software products; the need for maintenance service models; and the need for a maintenance strategy.

1.3 Field of application

This document is intended to provide guidance for the planning for and maintenance of software products or services, whether performed internally or externally to an organization. It is not intended to apply to the operation of the software.

This document is intended to provide guidance for two-party situations and can be equally applied where the two parties are from the same organization. This document is intended to also be used by a single party as self-imposed tasks (ISO/IEC/IEEE 12207).

This document is not intended for software products that are “throw-away” or a “short-term” solution.

This document is intended for self-imposition by organizations that develop off-the-shelf software products to maintain such products. Maintenance is applied to computer programs, code, data, documents, and records. It is intended to apply to software products created during the development of the software product. This can include, for example, the test software, test databases, the software test environment (STE), or the software engineering environment (SEE).

This document is intended for use in all maintenance efforts, regardless of the life cycle model (e.g. incremental, waterfall, evolutionary, spiral, agile, continuous iterative development). This document is not restricted by size, complexity, criticality, reliability, or application of the software product.

1.4 Limitations

This document describes the framework of the maintenance process but does not specify the details of how to implement or perform the activities and tasks included in the process.

In this document, there are a number of lists. None of these is presumed to be exhaustive. They are intended as examples.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC/IEEE 12207, *Systems and Software engineering — Software life cycle processes*