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IEEE Recommended Practice for Software Acquisition

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IEEE Computer Society

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IEEE-SA Standards Board

Abstract: A set of useful quality considerations that can be selected and applied during one or more steps in a software acquisition process is described in this recommended practice. The recommended practices can be applied to software that runs on any computer system regardless of the size, complexity, or criticality of the software. The software supply chain may include integration of off-the-shelf (OTS), custom, or free and open source software (FOSS). Each organization or individual using this recommended practice will need to identify the specific quality and activities that need to be included within its acquisition process.

Keywords: acquirer, custom developed, end user, FOSS, IEEE 1062™, off-the-shelf, OTS, SaaS, software acquisition process, software as a service, supplier

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Introduction

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This introduction provides some background on the rationale used to develop this recommended practice. This information is meant to aid in the understanding and usage of this recommended practice.

This recommended practice describes the management and execution of software acquisition activities. It is intended for the following:

- Individuals or organizations that acquire software from suppliers
- Individuals or organizations that acquire software from a developer for resale to other individuals or organizations
- Individuals or organizations that influence how software is acquired from suppliers
- Suppliers interested in providing high-quality software to acquirers

This recommended practice is designed to help organizations and individuals

- Incorporate quality considerations during the definition, evaluation, selection, and acceptance of supplier software for operational use
- Determine how supplier software should be evaluated, tested, and accepted for delivery to end users

This recommended practice is intended to satisfy the following objectives:

- Promote consistency within organizations in acquiring third-party software from software suppliers
- Provide useful practices on including quality considerations during software acquisition planning
- Provide useful practices on evaluating and qualifying supplier capabilities to meet user software requirements
- Provide useful practices on evaluating and qualifying supplier software
- Assist individuals or organizations judging the quality of supplier software for referral to end users

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1. Overview

This recommended practice is divided into six clauses. Clause 1 provides the scope of this recommended practice. Clause 2 lists references to other standards that are essential in applying this recommended practice. Clause 3 provides definitions that are either not found in other standards, or have been modified for use with this recommended practice. Clause 4 describes the options for acquiring software. Clause 5 describes the eight steps in a software acquisition process and the related quality practices that apply to acquiring software. Clause 6 describes how quality assurance can be applied to software acquisition.

This recommended practice also contains five annexes. Annex A provides a set of checklists that individuals or organizations may elect to adapt to their specific needs, Annex B provides software acquisition guidelines with respect to Software Safety Assurance and Software Information Security Assurance, Annex C provides guidelines with respect to rights in technical data software usage, Annex D provides acquisition plan guidelines, and Annex E is the bibliography.

1.1 Scope

This recommended practice describes a set of useful quality considerations that can be selected and applied during one or more steps in a software acquisition process. The recommended practices can be applied to software that runs on any computer system regardless of the size, complexity, or criticality of the software. The software supply chain may include integration of commercial-off-the-shelf (COTS), custom, or free and open source software (FOSS). Each organization or individual using this recommended practice will need to identify the specific quality and activities that need to be included within the organization’s acquisition process. Security will be included as a quality attribute considered during the acquisition.

1.2 Purpose

This recommended practice is designed to help organizations and individuals incorporate quality, including security considerations during the definition, evaluation, selection, and acceptance of supplier software for operational use. It will also help determine how supplier software should be evaluated, tested, and accepted for delivery to end users. This recommended practice is intended to satisfy the following objectives:

- Promote consistency within organizations in acquiring software from software suppliers.
- Provide useful practices on including quality, security, safety and data rights considerations during acquisition planning.
- Provide useful practices on evaluating and qualifying supplier capabilities to meet user requirements.
- Provide useful practices on evaluating and qualifying supplier software.
- Assist individuals or organizations judging the quality of supplier software for referral to end users.
- Assist suppliers in understanding how the software will be evaluated, tested, and accepted for delivery to end users.

Success in acquiring high-quality software products and services from software suppliers can be achieved by doing the following things:

- a) Identifying quality characteristics necessary to achieve the acquirer's objectives
- b) Selecting suppliers most capable of meeting the acquisition objectives
- c) Including quality considerations in the planning, evaluation, and acceptance activities
- d) Developing an organizational strategy for acquiring software
- e) Establishing a software acquisition process using the eight steps stated in 5.2 as a starting point
- f) Putting the defined process into practice

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

IEEE Std 1228™, IEEE Standard for Software Safety Plans.^{1, 2}

ISO/IEC/IEEE Std 12207, Systems and software engineering—Software life cycle processes.

ISO/IEC/IEEE Std 15288, Systems and software engineering—System life cycle processes.

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