International Standard

ISO/IEC/IEEE 32430

Software engineering — Software non-functional size measurement

Ingénierie du logiciel — Norme pour la quantification des caractéristiques non fonctionnelles des logiciels

Second edition
2025-02

Reference number
ISO/IEC/IEEE 32430:2025(en)

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Published in Switzerland

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Foreword

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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 document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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This document was prepared by Joint Technical Committee ISO/IEC/JTC 1, *Information technology,* Subcommittee SC 7, *Software and systems 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 second edition cancels and replaces the first edition (ISO/IEC/IEEE 32430:2021), which has been technically revised.

The main changes are as follows:

— clarifications of terminology regarding software size and software non-functional requirements.

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.

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Introduction

Used in conjunction with functional size measurement (FSM), non-functional size measurement (NFSM) assists organizations in multiple ways. It provides insight into the delivery of software projects and maintenance of software and assists in estimating the effort and in the analysis of key performance indicators, such as quality and productivity.

Having both software functional size and non-functional size provides significant information for the management of software product development. The functional size is quantifiable and represents a standardized measure of the functional project/application size. Providing a quantifiable measure derived from the non-functional requirements (NFR) for the software allows organizations to build historical data repositories that can be referenced to assist in decision making for the technical or quality aspects of applications.

By learning the method as described in this document and by performing the non-functional sizing together with functional sizing, users avoid duplication of measurement effort.

Having this information enables software professionals to do the following:

a) plan and estimate projects;

b) compare projects and compare the project to benchmarks;

c) identify areas of improvement and analyze trends of improvement;

d) quantify the impacts of the current non-functional strategies;

e) assist in determining future non-functional strategies;

f) provide specific data when communicating non-functional issues to various audiences;

g) communicate the impact of non-functional requirements (NFR) on the project with users and customers;

h) help users determine the benefit of an application package to their organization by assessing portions or categories that specifically match their requirements;

i) determine the non-functional size of a purchased application package.

NFSM is independent of the way NFR are defined. Analyzing the requirements to measure the non-functional size can assist in identifying implicit requirements.

This document contains rules on how to use ISO/IEC 20926:2009 (IFPUG FSM) and NFSM together, so that there are no gaps and no overlaps between the functional size and the non-functional size. A software requirement that contains both functional and non-functional aspects can be sized using ISO/IEC 20926:2009 for its functional aspects and this document for its non-functional aspects.

FSM and NFSM together can provide a broader view of the size of the software product.

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Software engineering — Software non-functional size measurement

1 Scope

1.1 Overview

This document defines a method for measuring the non-functional size of the software. It complements ISO/IEC 20926:2009, which defines a method for measuring the functional size of the software.

This document also describes the complementarity of functional and non-functional sizes, so that deriving the sizes from the functional and the non-functional requirements does not result in duplication in the distinct functional and non-functional sizes.

In general, there are many types of non-functional requirements. Moreover, non-functional requirements and their classification evolve over time as the technology advances. This document does not intend to define the type of NFR for a given context. Users can choose ISO 25010 or any other standard for the definition of NFR. It is assumed that users size the NFR based on the definitions they use.

This document covers a subset of non-functional requirements. It is expected that, with time, the state of the art can improve and that potential future versions of this document can define an extended coverage. The ultimate goal is a version that, together with ISO/IEC 20926:2009, covers every aspect that can be required of any prospective piece of software, including aspects such as process and project directives that are hard or impossible to trace to the software's algorithm or data. The combination of functional and non-functional sizes would then correspond to the total size necessary to bring the software into existence.

Estimating the cost, effort and duration of the implementation of the NFR is outside the scope of this document.

1.2 Purpose

The purpose of this document is to define a method for measuring the non-functional size of the software.

1.3 Word usage

The word *"shall"* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted *("shall"* equals is required to).[1),2)]

The word *"should"* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (*"should"* equals is recommended that).

The word *"may"* is used to indicate a course of action permissible within the limits of the standard (*"may"* equals is permitted to).

The word *"can"* is used for statements of possibility and capability, whether material, physical, or causal ("can" equals is able to).

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1) The use of the word *"must"* is deprecated and shall not be used when stating mandatory requirements, *must* is used only to describe unavoidable situations.

2) The use of *"will"* is deprecated and shall not be used when stating mandatory requirements, "will" is only used in statements of fact.

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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 14143-1:2007, *Information technology — Software measurement — Functional size measurement — Part 1: Definition of concepts*

ISO/IEC 20926:2009, *Software and systems engineering — Software measurement — IFPUG functional size measurement method 2009*

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