

INTERNATIONAL
STANDARD

ISO/IEC/
IEEE
32430

First edition
2021-10

Software engineering — Trial use standard for software non-functional sizing measurements

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC/IEEE 32430:2021](https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021)

[https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-
f00a693c0930/iso-iec-ieee-32430-2021](https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021)



Reference number
ISO/IEC/IEEE 32430:2021(E)

© IEEE 2019

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC/IEEE 32430:2021](https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021)
<https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021>



COPYRIGHT PROTECTED DOCUMENT

© IEEE 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from IEEE at the address below.

Institute of Electrical and Electronics Engineers, Inc
3 Park Avenue, New York
NY 10016-5997, USA

Email: stds.ipr@ieee.org
Website: www.ieee.org

Published in Switzerland

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 editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board. The IEEE develops its standards through a consensus development process, approved by the American National Standards Institute, which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and serve without compensation. While the IEEE administers the process and establishes rules to promote fairness in the consensus development process, the IEEE does not independently evaluate, test, or verify the accuracy of any of the information contained in its standards.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see patents.iec.ch).

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 32430 was prepared by the Systems and Software Engineering Standards Committee of the IEEE Computer Society (as IEEE Std 2430-2019) and drafted in accordance with its editorial rules. It was adopted, under the “fast-track procedure” defined in the Partner Standards Development Organization cooperation agreement between ISO and IEEE, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/IEC/IEEE 32430:2021

<https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021>

IEEE Trial-Use Standard for Software Non-Functional Sizing Measurements

Developed by the

Software & Systems Engineering Standards Committee (C/S2ESC)
of the
IEEE Computer Society

Approved 13 June 2019

IEEE-SA Standards Board

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC/IEEE 32430:2021](https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021)

<https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021>

Abstract: A method for the sizing of nonfunctional software requirements is defined in this standard. It complements ISO/IEC 20926:2009, which defines a method for the sizing of functional user requirements. Non-functional categories for data operations, interface design, technical environment, and architecture software are included in this standard. Steps to determine and calculate the non-functional size are also included. Handling requirements involving both functional and non-functional requirements are explained in this standard, which also covers how to apply non-functional sizing estimates in terms of cost, project duration and quality, and considerations of software performance in terms of productivity and quality. The combination of functional and non-functional size should correspond to the total size necessary to produce the software. The functional size and non-functional size are orthogonal, and both are needed when sizing the software. The complementarity of the functional and the non-functional sizes, to avoid overlaps or gaps between the two size methods, are described in this standard. Calculating the implementation work effort and duration of the non-functional requirements is outside the scope of this standard.

Keywords: IEEE 2430™, IFPUG, non-functional size measurements, non-functional requirements, SNAP

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/IEC/IEEE 32430:2021](https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021)

<https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021>

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

Copyright © 2019 by The Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 16 October 2019. Printed in the United States of America.

IEEE is a registered trademark in the U.S. Patent & Trademark Office, owned by The Institute of Electrical and Electronics Engineers, Incorporated.

W3C is trademarks or registered trademarks of the W3C®, (registered in numerous countries) World Wide Web Consortium. Marks of W3C are registered and held by its host institutions: Massachusetts Institute of Technology (MIT), European Research Consortium for Information and Mathematics (ERCIM), and Keio University, Japan.

PDF: ISBN 978-1-5044-5987-7 STD23763
Print: ISBN 978-1-5044-5988-4 STDPD23763

IEEE prohibits discrimination, harassment, and bullying.

For more information, visit <https://www.ieee.org/web/aboutus/whatis/policies/p9-26.html>.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

Important Notices and Disclaimers Concerning IEEE Standards Documents

IEEE documents are made available for use subject to important notices and legal disclaimers. These notices and disclaimers, or a reference to this page, appear in all standards and may be found under the heading “Important Notices and Disclaimers Concerning IEEE Standards Documents.” They can also be obtained on request from IEEE or viewed at <https://standards.ieee.org/ipr/disclaimers.html>.

Notice and Disclaimer of Liability Concerning the Use of IEEE Standards Documents

IEEE Standards documents (standards, recommended practices, and guides), both full-use and trial-use, are developed within IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (“IEEE-SA”) Standards Board. IEEE (“the Institute”) develops its standards through a consensus development process, approved by the American National Standards Institute (“ANSI”), which brings together volunteers representing varied viewpoints and interests to achieve the final product. IEEE Standards are documents developed through scientific, academic, and industry-based technical working groups. Volunteers in IEEE working groups are not necessarily members of the Institute and participate without compensation from IEEE. While IEEE administers the process and establishes rules to promote fairness in the consensus development process, IEEE does not independently evaluate, test, or verify the accuracy of any of the information or the soundness of any judgments contained in its standards.

IEEE Standards do not guarantee or ensure safety, security, health, or environmental protection, or ensure against interference with or from other devices or networks. Implementers and users of IEEE Standards documents are responsible for determining and complying with all appropriate safety, security, environmental, health, and interference protection practices and all applicable laws and regulations.

IEEE does not warrant or represent the accuracy or content of the material contained in its standards, and expressly disclaims all warranties (express, implied and statutory) not included in this or any other document relating to the standard, including, but not limited to, the warranties of: merchantability; fitness for a particular purpose; non-infringement; and quality, accuracy, effectiveness, currency, or completeness of material. In addition, IEEE disclaims any and all conditions relating to: results; and workmanlike effort. IEEE standards documents are supplied “AS IS” and “WITH ALL FAULTS.”

Use of an IEEE standard is wholly voluntary. The existence of an IEEE standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard.

In publishing and making its standards available, IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity nor is IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing any IEEE Standards document, should rely upon his or her own independent judgment in the exercise of reasonable care in any given circumstances or, as appropriate, seek the advice of a competent professional in determining the appropriateness of a given IEEE standard.

IN NO EVENT SHALL IEEE BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO: PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE PUBLICATION, USE OF, OR RELIANCE UPON ANY STANDARD, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE AND REGARDLESS OF WHETHER SUCH DAMAGE WAS FORESEEABLE.

Translations

The IEEE consensus development process involves the review of documents in English only. In the event that an IEEE standard is translated, only the English version published by IEEE should be considered the approved IEEE standard.

Official statements

A statement, written or oral, that is not processed in accordance with the IEEE-SA Standards Board Operations Manual shall not be considered or inferred to be the official position of IEEE or any of its committees and shall not be considered to be, or be relied upon as, a formal position of IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position of IEEE.

Comments on standards

Comments for revision of IEEE Standards documents are welcome from any interested party, regardless of membership affiliation with IEEE. However, IEEE does not provide consulting information or advice pertaining to IEEE Standards documents. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments. Since IEEE standards represent a consensus of concerned interests, it is important that any responses to comments and questions also receive the concurrence of a balance of interests. For this reason, IEEE and the members of its societies and Standards Coordinating Committees are not able to provide an instant response to comments or questions except in those cases where the matter has previously been addressed. For the same reason, IEEE does not respond to interpretation requests. Any person who would like to participate in revisions to an IEEE standard is welcome to join the relevant IEEE working group.

Comments on standards should be submitted to the following address:

Secretary, IEEE-SA Standards Board
445 Hoes Lane
Piscataway, NJ 08854 USA

Laws and regulations

Users of IEEE Standards documents should consult all applicable laws and regulations. Compliance with the provisions of any IEEE Standards document does not imply compliance to any applicable regulatory requirements. Implementers of the standard are responsible for observing or referring to the applicable regulatory requirements. IEEE does not, by the publication of its standards, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

IEEE draft and approved standards are copyrighted by IEEE under US and international copyright laws. They are made available by IEEE and are adopted for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of engineering practices and methods. By making these documents available for use and adoption by public authorities and private users, IEEE does not waive any rights in copyright to the documents.

Photocopies

Subject to payment of the appropriate fee, IEEE will grant users a limited, non-exclusive license to photocopy portions of any individual standard for company or organizational internal use or individual, non-commercial use only. To arrange for payment of licensing fees, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; +1 978 750 8400. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Updating of IEEE Standards documents

Users of IEEE Standards documents should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of amendments, corrigenda, or errata. A current IEEE document at any point in time consists of the current edition of the document together with any amendments, corrigenda, or errata then in effect.

Every IEEE standard is subjected to review at least every 10 years. When a document is more than 10 years old and has not undergone a revision process, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE standard.

In order to determine whether a given document is the current edition and whether it has been amended through the issuance of amendments, corrigenda, or errata, visit IEEE Xplore at <https://ieeexplore.ieee.org/> or contact IEEE at the address listed previously. For more information about the IEEE-SA or IEEE's standards development process, visit the IEEE-SA Website at <http://standards.ieee.org>.

Errata

[ISO/IEC/IEEE 32430:2021](https://standards.ieee.org/standard/32430-2021)

[https://standards.ieee.org/catalog/standards/sist/bf0d8aad-a481-4f53-b661-](https://standards.ieee.org/catalog/standards/sist/bf0d8aad-a481-4f53-b661-100a095c0956/iso-iec-32430-2021)

Errata, if any, for IEEE standards can be accessed via <https://standards.ieee.org/standard/index.html>. Search for standard number and year of approval to access the web page of the published standard. Errata links are located under the Additional Resources Details section. Errata are also available in IEEE Xplore: <https://ieeexplore.ieee.org/browse/standards/collection/ieee/>. Users are encouraged to periodically check for errata.

Patents

Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken by the IEEE with respect to the existence or validity of any patent rights in connection therewith. If a patent holder or patent applicant has filed a statement of assurance via an Accepted Letter of Assurance, then the statement is listed on the IEEE-SA Website at <https://standards.ieee.org/about/sasb/patcom/patents.html>. Letters of Assurance may indicate whether the Submitter is willing or unwilling to grant licenses under patent rights without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination to applicants desiring to obtain such licenses.

Essential Patent Claims may exist for which a Letter of Assurance has not been received. The IEEE is not responsible for identifying Essential Patent Claims for which a license may be required, for conducting inquiries into the legal validity or scope of Patents Claims, or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from the IEEE Standards Association.

Trial-use standards

Publication of this trial-use standard for comment and criticism has been approved by the Institute of Electrical and Electronics Engineers, Inc. Trial-use standards are effective for 36 months from the date of publication. Comments for revision will be accepted for 24 months after publication. Suggestions for revision should be directed to the Secretary, IEEE-SA Standards Board, 445 Hoes Lane, Piscataway, NJ 08855, and should be received no later than 16 October 2021.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/IEC/IEEE 32430:2021](https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021)

<https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021>

Participants

At the time this IEEE trial-use standard was completed, the P2430 Working Group had the following membership:

Talmon Ben-Cnaan, *Chair*

Bill Curtis
Victoria (Vicky) Hailey
Annette Reilly

Robert Schaaf
Roopali Thapar

Charley Tichenor
Altaz Valani
Kiran Yeole

The following members of the individual balloting committee voted on this trial-use standard. Balloters may have voted for approval, disapproval, or abstention.

Robert Aiello
Talmon Ben-Cnaan
Juris Borzovs
Pieter Botman
Demetrio Bucaneg Jr.
Paul Cardinal
Lawrence Catchpole
Jan de Liefde
Yaacov Fenster
Andrew Fieldsend
David Fuschi
Julian Gomez
Randall Groves
Victoria (Vicky) Hailey
Mark Henley

Werner Hoelzl
Noriyuki Ikeuchi
Atsushi Ito
Srinivasa Rao
Kanneganti
Piotr Karocki
David Leciston
Johnny Marques
LaMont McAliley
Rajesh Murthy
Nick S.A. Nikjoo
Mark Paulk
Annette Reilly
Saurabh Saxena
Robert Schaaf
Stephen Schwarm

Carl Singer
Kendall Southwick
Friedrich Stalling
Thomas Starai
Walter Struppler
Marcy Stutzman
Sachin Thakur
Roopali Thapar
Charley Tichenor
John Vergis
Scott Willy
Steven Woodward
Jian Yu
Oren Yuen
Janusz Zalewski

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/IEC/IEEE 32430:2021
<https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021>

When the IEEE-SA Standards Board approved this trial-use standard on 13 June 2019, it had the following membership:

Gary Hoffman, *Chair*

Ted Burse, *Vice Chair*

Jean-Philippe Faure, *Past Chair*

Konstantinos Karachalios, *Secretary*

Masayuki Ariyoshi
Stephen D. Dukes
J. Travis Griffith
Guido Hiertz
Christel Hunter
Thomas Koshy
Joseph L. Koepfinger*
Thomas Koshy

John D. Kulick
David J. Law
Joseph Levy
Howard Li
Xiaohui Liu
Kevin Lu
Daleep Mohla
Andrew Myles

Annette D. Reilly
Dorothy Stanley
Sha Wei
Phil Wennblom
Philip Winston
Howard Wolfman
Feng Wu
Jingyi Zhou

*Member Emeritus

Introduction

This introduction is not part of IEEE Std 2430-2019, IEEE Trial-Use Standard for Software Non-Functional Sizing Measurements.

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 good measure of the functional project/application size. Providing a quantifiable measure for the non-functional requirements (NFR) allows organizations to build historical data repositories that can be referenced to assist in decision making for the technical and/or quality aspects of applications.

Non-functional sizing assists organization in multiple ways (see [Annex A](#)). It provides insight into projects and applications to assist in effort and cost estimating and in the analysis of quality and productivity. Used in conjunction with function-point analysis, non-functional sizing provides information that can identify additional software size, which may impact quality and productivity in a positive or negative way. Having this information enables software professionals to:

- Better plan, schedule, and estimate projects.
- Identify areas of process improvement.
- Assist in determining future technical strategies.
- Quantify the impacts of the current technical strategies.
- Improve quality: Analyzing non-functional size may assist in identifying implicit requirement and may assist in analyzing the components of the solution to meet the NFR by looking at the sizing attributes.

By learning the methodology as described in this standard and by performing the non-functional sizing together with functional sizing, the added time and effort to size the NFR is small.

<https://standards.iteh.ai/catalog/standards/sist/bf0d8aad-a481-4f53-b661-f00a693c0930/iso-iec-ieee-32430-2021>

Acknowledgments

The author thanks the International Electrotechnical Commission (IEC) for permission to reproduce information from its international standards. All such extracts are copyright of IEC Geneva, Switzerland. All rights reserved. Further information on the IEC is available from www.iec.ch. IEC has no responsibility for the placement and context in which the extracts and contents are reproduced by the author, nor is IEC in any way responsible for the other content or accuracy therein.

Portions of the Software Non-functional Assessment Process (SNAP), Assessment Practices Manual, Release 2.4, reprinted with permission from IFPUG, ©2017.

Contents

| | |
|---|----|
| 1. Overview | 10 |
| 1.1 Scope | 10 |
| 1.2 Purpose | 10 |
| 1.3 Word usage | 11 |
| 2. Normative references | 11 |
| 3. Definitions, acronyms, and abbreviations | 12 |
| 3.1 Definitions | 12 |
| 3.2 Abbreviations | 16 |
| 4. Introductory Information | 17 |
| 4.1 Non-Functional Software Size Measurement (NFSSM) introduction | 17 |
| 4.2 Software-intensive system and software product | 18 |
| 4.3 Software domains | 18 |
| 4.4 The relations between non-functional requirements (NFR) definition and functional user requirements (FUR) | 18 |
| 4.5 Key features of the NFSSM | 20 |
| 4.6 Future evolution of NFR | 21 |
| 4.7 Objectives and benefits | 22 |
| 5. Non-functional size: Categories and sub-categories | 23 |
| 5.1 Category 1: Data operations | 23 |
| 5.2 Category 2: Interface design | 32 |
| 5.3 Category 3: Technical environment | 41 |
| 5.4 Category 4: Architecture | 47 |
| 5.5 Sizing code data | 52 |
| 6. The sizing process | 55 |
| 6.1 The timing of the non-functional sizing | 56 |
| 6.2 Non-functional sizing and FSM | 56 |
| 6.3 Steps to determine the non-functional size | 57 |
| 6.4 Calculating the Non-functional size | 63 |
| 7. Complementarity of the functional and the non-functional sizes | 66 |
| 7.1 Requirements involving functional and non-functional requirements | 67 |
| 8. Use of non-functional software sizing | 77 |
| 8.1 Functional size and non-functional size | 77 |
| 8.2 Project management | 77 |
| 8.3 Performance management | 81 |
| Annex A (informative) NFSSM strengths | 84 |
| Annex B (informative) Bibliography | 85 |

IEEE Trial-Use Standard for Software Non-Functional Sizing Measurements

1. Overview

1.1 Scope

This standard defines a method for the sizing of non-functional software requirements. It complements ISO/IEC 20926:2009, which defines a method for the sizing of functional user requirements (FUR).¹

This standard also describes the complementarity of functional and non-functional sizes, so that sizing both functional and non-functional requirements (NFR) do not overlap. It also describes how non-functional size, together with functional size, should be used for measuring the performance of software projects, setting benchmarks, and estimating the cost and duration of software projects.

In general, there are many types of non-functional software requirements. Moreover, non-functional aspects evolve over time and may include additional aspects in the as technology advances. This standard does not intend to define the type of NFR for a given context. Users may choose ISO 25010:2011 or any other standard for the definition of NFR. It is assumed that users will size the NFR based on the definitions they use.

This standard covers a subset of non-functional types. It is expected that, with time, the state of the art can improve and that potential future versions of this standard can define an extended coverage. The ultimate goal is a version that, together with ISO/IEC 20926:2009, covers every aspect that may 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 size would then correspond to the total size necessary to bring the software into existence.

Calculating the effort and duration of the implementation of the NFR is outside the scope of this standard.

1.2 Purpose

The purpose of this standard is to define the method of sizing of NFR and describe how to use this size, alongside with the functional size.

¹Information on references can be found in [Clause 2](#).

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).^{2,3}

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).

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.

ISO/IEC 14143-1:2007, Information Technology—Software measurement—Functional size measurement.^{4,5}

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

ISO/IEC 25010:2011, Systems and software engineering—Systems and software Quality Requirements and Evaluation (SQuaRE)—System and software quality models.

ISO/IEC TR 14143-5:2004 Information technology—Software measurement—Functional size measurement—Part 5: Determination of functional domains for use with functional size measurement.

ISO/IEC/IEEE 24765:2017, Systems and software engineering—Vocabulary.^{6,7}

²The use of the word *must* is deprecated and shall not be used when stating mandatory requirements, *must* is used only to describe unavoidable situations.

³The use of *will* is deprecated and shall not be used when stating mandatory requirements, *will* is only used in statements of fact.

⁴ISO publications are available from the International Organization for Standardization (<https://www.iso.org/>) and the American National Standards Institute (<https://www.ansi.org/>).

⁵IEC publications are available from the International Electrotechnical Commission (<https://www.iec.ch/>). IEC publications are also available in the United States from the American National Standards Institute (<http://www.ansi.org>).

⁶The IEEE standards or products referred to in this clause are trademarks of The Institute of Electrical and Electronics Engineers, Inc.

⁷IEEE publications are available from The Institute of Electrical and Electronics Engineers, 445 Hoes Lane, Piscataway, NJ 08854, USA (<https://standards.ieee.org/>).