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## **Software engineering — Product quality —**

### **Part 3: Internal metrics**

*Génie du logiciel — Qualité des produits —*

*Partie 3: Métrologie interne*

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## Contents

Page

Foreword.....	vi
Introduction .....	vii
1 Scope.....	1
2 Conformance .....	2
3 Normative references.....	2
4 Terms and definitions .....	2
5 Abbreviated terms .....	2
6 Use of software quality metrics .....	3
7 How to read and use the metrics tables .....	4
8 Metrics tables.....	4
8.1 Functionality metrics.....	4
8.1.1 Suitability metrics .....	5
8.1.2 Accuracy metrics .....	5
8.1.3 Interoperability metrics.....	5
8.1.4 Security metrics.....	5
8.1.5 Functionality compliance metrics .....	5
8.2 Reliability metrics .....	12
8.2.1 Maturity metrics.....	12
8.2.2 Fault tolerance metrics .....	12
8.2.3 Recoverability metrics .....	12
8.2.4 Reliability compliance metrics.....	12
8.3 Usability Metrics .....	17
8.3.1 Understandability metrics .....	17
8.3.2 Learnability metrics .....	17
8.3.3 Operability metrics .....	17
8.3.4 Attractiveness metrics .....	17
8.3.5 Usability compliance metrics.....	17
8.4 Efficiency metrics .....	24
8.4.1 Time behaviour metrics .....	24
8.4.2 Resource utilization metrics .....	24
8.4.3 Efficiency compliance metrics.....	24
8.5 Maintainability metrics .....	28
8.5.1 Analysability metrics .....	28
8.5.2 Changeability metrics .....	28
8.5.3 Stability metrics.....	28
8.5.4 Testability metrics .....	28
8.5.5 Maintainability compliance metrics.....	28
8.6 Portability metrics.....	34
8.6.1 Adaptability metrics .....	34
8.6.2 Installability metrics .....	34

This is a preview of "ISO/IEC TR 9126-3:20...". Click here to purchase the full version from the ANSI store.

8.6.3	Co-existence metrics.....	34
8.6.4	Replaceability metrics.....	34
8.6.5	Portability compliance metrics.....	34
<b>Annex A</b> (informative)	<b>Considerations When Using Metrics</b> .....	<b>41</b>
<b>A.1</b>	<b>Interpretation of measures</b> .....	<b>41</b>
<b>A.1.1</b>	<b>Potential differences between test and operational contexts of use</b> .....	<b>41</b>
<b>A.1.2</b>	<b>Issues affecting validity of results</b> .....	<b>42</b>
<b>A.1.3</b>	<b>Balance of measurement resources</b> .....	<b>42</b>
<b>A.1.4</b>	<b>Correctness of specification</b> .....	<b>42</b>
<b>A.2</b>	<b>Validation of Metrics</b> .....	<b>42</b>
<b>A.2.1</b>	<b>Desirable Properties for Metrics</b> .....	<b>42</b>
<b>A.2.2</b>	<b>Demonstrating the Validity of Metrics</b> .....	<b>43</b>
<b>A.3</b>	<b>Use of metrics for estimation (judgement) and prediction (forecast)</b> .....	<b>44</b>
<b>A.3.1</b>	<b>Quality characteristics prediction by current data</b> .....	<b>44</b>
<b>A.3.2</b>	<b>Current quality characteristics estimation on current facts</b> .....	<b>44</b>
<b>A.4</b>	<b>Detecting deviations and anomalies in quality problem prone components</b> .....	<b>45</b>
<b>A.5</b>	<b>Displaying measurement results</b> .....	<b>45</b>
<b>Annex B</b> (informative)	<b>Use of Quality in Use, External &amp; Internal Metrics (Framework Example)</b> .....	<b>46</b>
<b>B.1</b>	<b>Introduction</b> .....	<b>46</b>
<b>B.2</b>	<b>Overview of Development and Quality Process</b> .....	<b>46</b>
<b>B.3</b>	<b>Quality Approach Steps</b> .....	<b>47</b>
<b>B.3.1</b>	<b>General</b> .....	<b>47</b>
<b>B.3.2</b>	<b>Step #1 Quality requirements identification</b> .....	<b>47</b>
<b>B.3.3</b>	<b>Step #2 Specification of the evaluation</b> .....	<b>48</b>
<b>B.3.4</b>	<b>Step #3 Design of the evaluation</b> .....	<b>50</b>
<b>B.3.5</b>	<b>Step #4 Execution of the evaluation</b> .....	<b>50</b>
<b>B.3.6</b>	<b>Step #5 Feedback to the organization</b> .....	<b>50</b>
<b>Annex C</b> (informative)	<b>Detailed explanation of metric scale types and measurement types</b> .....	<b>51</b>
<b>C.1</b>	<b>Metric Scale Types</b> .....	<b>51</b>
<b>C.2</b>	<b>Measurement Types</b> .....	<b>52</b>
<b>C.2.1</b>	<b>Size Measure Type</b> .....	<b>52</b>
<b>C.2.2</b>	<b>Time measure type</b> .....	<b>55</b>
<b>C.2.2.0</b>	<b>General</b> .....	<b>55</b>
<b>C.2.3</b>	<b>Count measure type</b> .....	<b>56</b>
<b>Annex D</b> (informative)	<b>Term(s)</b> .....	<b>58</b>
<b>D.1</b>	<b>Definitions</b> .....	<b>58</b>
<b>D.1.1</b>	<b>Quality</b> .....	<b>58</b>
<b>D.1.2</b>	<b>Software and user</b> .....	<b>58</b>
<b>D.1.3</b>	<b>Measurement</b> .....	<b>59</b>
<b>Annex E</b> (informative)	<b>Pure Internal Metrics</b> .....	<b>60</b>
<b>E.1</b>	<b>Pure Internal Metrics</b> .....	<b>60</b>

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<b>Table 8.1.1 Suitability metrics</b> .....	<b>6</b>
<b>Table 8.1.2 Accuracy metrics</b> .....	<b>8</b>
<b>Table 8.1.3 Interoperability metrics</b> .....	<b>9</b>
<b>Table 8.1.4 Security metrics</b> .....	<b>10</b>
<b>Table 8.1.5 Functionality compliance metrics</b> .....	<b>11</b>
<b>Table 8.2.1 Maturity metrics</b> .....	<b>13</b>
<b>Table 8.2.2 Fault tolerance metrics</b> .....	<b>14</b>
<b>Table 8.2.3 Recoverability metrics</b> .....	<b>15</b>
<b>Table 8.2.4 Reliability compliance metrics</b> .....	<b>16</b>
<b>Table 8.3.1 Understandability metrics</b> .....	<b>18</b>
<b>Table 8.3.2 Learnability metrics</b> .....	<b>19</b>
<b>Table 8.3.3 Operability metrics</b> .....	<b>20</b>
<b>Table 8.3.4 Attractiveness metrics</b> .....	<b>22</b>
<b>Table 8.3.5 Usability compliance metrics</b> .....	<b>23</b>
<b>Table 8.4.1 Time behaviour metrics</b> .....	<b>25</b>
<b>Table 8.4.2 Resource utilisation metrics</b> .....	<b>26</b>
<b>Table 8.4.3 Efficiency compliance metrics</b> .....	<b>27</b>
<b>Table 8.5.1 Analysability metrics</b> .....	<b>29</b>
<b>Table 8.5.2 Changeability metrics</b> .....	<b>30</b>
<b>Table 8.5.3 Stability metrics</b> .....	<b>31</b>
<b>Table 8.5.4 Testability metrics</b> .....	<b>32</b>
<b>Table 8.5.5 Maintainability compliance metrics</b> .....	<b>33</b>
<b>Table 8.6.1 Adaptability metrics</b> .....	<b>35</b>
<b>Table 8.6.2 Installability metrics</b> .....	<b>37</b>
<b>Table 8.6.3 Co-existence metrics</b> .....	<b>38</b>
<b>Table 8.6.4 Replaceability metrics</b> .....	<b>39</b>
<b>Table 8.6.5 Portability compliance metrics</b> .....	<b>40</b>
<b>Table B.1 Quality Measurement Model</b> .....	<b>46</b>
<b>Table B.2 User Needs Characteristics &amp; Weights</b> .....	<b>47</b>
<b>Table B.3 Quality measurement tables</b> .....	<b>48</b>
<b>Table B.4 Measurement plan</b> .....	<b>50</b>

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

In exceptional circumstances, the joint 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 the joint 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.

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.

ISO/IEC TR 9126-3:2003, which is a Technical Report of type 2, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and system engineering*.

This document is being issued in the Technical Report (type 2) series of publications (according to the Procedures for the technical work of ISO/IEC JTC 1) as a "prospective standard for provisional application" in the field of external metrics for quantitatively measuring external software because there is an urgent need for guidance on how standards in this field should be used to meet an identified need.

This document is not to be regarded as an "International Standard". It is proposed for provisional application so that information and experience of its use in practice may be gathered. Comments on the content of this document should be sent to the ISO Central Secretariat.

A review of this Technical Report (type 2) will be carried out not later than three years after its publication with the options of: extension for another three years; conversion into an International Standard; or withdrawal.

ISO/IEC 9126 consists of the following parts, under the general title *Software engineering — Product quality*:

- *Part 1: Quality model*
- *Part 2: External metrics*
- *Part 3: Internal metrics*
- *Part 4: Quality in use metrics*

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## Introduction

This Technical Report provides internal metrics for measuring attributes of six external quality characteristics defined in ISO/IEC 9126-1. The metrics listed in this Technical Report are not intended to be an exhaustive set. Developers, evaluators, quality managers and acquirers may select metrics from this Technical Report for defining requirements, evaluating software products, measuring quality aspects and other purposes. They may also modify the metrics or use metrics which are not included here. This Technical Report is applicable to any kind of software product, although each of the metrics is not always applicable to every kind of software product.

ISO/IEC 9126-1 defines terms for the software quality characteristics and how these characteristics are decomposed into subcharacteristics. ISO/IEC 9126-1, however, does not describe how any of these subcharacteristics could be measured. ISO/IEC TR 9126-2 defines external metrics, ISO/IEC TR 9126-3 defines internal metrics and ISO/IEC 9126-4 defines quality in use metrics, for measurement of the characteristics or the subcharacteristics. Internal metrics measure the software itself, external metrics measure the behaviour of the computer-based system that includes the software, and quality in use metrics measure the effects of using the software in a specific context of use.

This Technical Report is intended to be used together with ISO/IEC 9126-1. It is strongly recommended to read ISO/IEC 14598-1 and ISO/IEC 9126-1, prior to using this Technical Report, particularly if the reader is not familiar with the use of software metrics for product specification and evaluation.

Clauses 1 to 7 and Annexes A to D are common to ISO/IEC TR 9126-2, ISO/IEC TR 9126-3, and ISO/IEC 9126-4. Annex E is for ISO/IEC TR 9126-3 use.