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Systems and software engineering - Systems and software quality requirements and evaluation (SQuaRE) - Part 20: Quality measurement framework

系统与软件工程 系统与软件质量要求和评价（SQuaRE） 第 20 部分：质量测量框架

(English Translation)

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Reference

1 Scope

This part of GB/T 25000 specifies the framework for carrying out quality measurement work. The content of this section is as follows.

---Quality measurement reference model;

---The relationship between different types of quality measures;

---Guidelines for choosing quality measures;

---Guidelines for constructing quality measures;

---Guidelines for planning and performing measurements;

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---Guidelines for applying measurement results.

This section also gives considerations for the selection of quality measurement and quality measurement elements (see Appendix A), and the measurement reliability and quality measurement are valid.

The evaluation of quality (see Appendix B), the elements of compiling quality measures (see Appendix C), the normalization of the measurement function of quality measures (see Appendix C)

D) and the measurement information model in ISO /IEC /IEEE15939 (see Appendix E).

This part can be used to design, identify, evaluate and implement system and software product quality, use quality and data quality measurement models. The The reference model can be used by developers, demanders, quality assurance personnel, and independent evaluators, especially responsible for specifying and evaluating ICT systems Used by quality personnel.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article Pieces. For undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 25000.1 System and Software Engineering System and Software Quality Requirements and Evaluation (SQuaRE) Part 1: SQuaRE Guide (GB/T 25000.1-2021, ISO /IEC 25000:2014, MOD) ISO /IEC /IEEE15939 system and software engineering measurement process (Systemsandsoftwareengineering-Meas-urementprocess)

3 Terms and definitions

The following terms and definitions defined in GB/T 25000.1 and ISO /IEC /IEEE15939 apply to this document.

3.1 Derived measure

A measure defined by a function of at least two basic measure values. [Source: ISO /IEC /IEEE15939.2017, definition 3.3, with modification]

The quality of use requirements are based on the expected results/consequences of the system and/or software products (e.g., the cost of the user to complete a specific expected task Time) to determine effectiveness, efficiency, satisfaction, anti-risk and surrounding coverage. They can derive the use of external quality requirements (for example, throughput Volume, response time, etc.). The use of external quality requirements should adopt external QM criteria in the quality requirements specification.

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Quantitative descriptions are performed, and these criteria are used when evaluating target entities. The use of external quality requirements can derive the use of internal quality Requirements (for example, the complexity of the program structure, etc.). Use internal quality requirements to reflect technical/structural characteristics. They can be used to specify The nature of deliverable, non-executable software products (such as documents and manuals). They can also be used as the target entity for verification and are Define verification criteria for each stage.

Through the quality life cycle, the required quality can be measured at different levels for verification and confirmation. At the usage level, usage week The environment plays an important role in the confirmation between the use quality requirements and the quality impact. At the operational level, use external quality requirements and external The quality of the department can be mutually confirmed and verified. At the implementation level, the quality requirements using internal properties and internal quality properties can be mutually confirmed And verification.

Note: The use of quality QM means the quality explained by the influence of stakeholders; the external QM means that it is used in prototype testing, product testing and actual testing.

The quality explained by the behavior of the target entity when used; internal QM means that it is explained by the results of the specification and/or source code review the quality of.

6.3 Selection of QM

QM is to meet the information needs of developers, demanders, managers, direct and indirect users, and other stakeholders. of. Candidate QMs that potentially meet quality requirements should be determined from the part of GB/T 25000 that provides specific QMs, such as GB/T 25000.22,

GB/T 25000.23 or GB/T 25000.24. Then, the candidate QM can be further refined as needed. At least it should be stated that QM (package A criterion including a combination of measures explains the reason for choosing QM. A variety of different combinations of basic measures and derived measures can be selected to build attachments Added QM, these QMs are used as indicators to clarify specific quality requirements. When choosing QM, it is recommended to consider the following factors.

Level of relevance of information needs; the feasibility of collecting data in the organizational unit; the availability of human resources for collecting and managing data; receipt How easy it is to collect data. When QM is used to define quality requirements, the criticality of these quality requirements or insufficient quality requirements definition results Risk can be used as one of the criteria for choosing QM. When using QM to evaluate quality, applicable rigor and timeliness can be used as guidelines.

The selected measure will affect people's behavior. In many cases, this behavior may be

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due to someone trying to profit from the relevant system.

Will cause abnormal results. Users should anticipate these challenges and take measures (including training, guidance and additional strategic governance) to reduce risk.

The criteria for selecting QM to meet these information needs should be documented. Appendix A provides suggestions on the criteria for selecting QM.

Note 1: GB/T 25000.30 and GB/T 25000.40 respectively provide guidance for quality requirements specification and product quality evaluation.

When using modified or not in the quality measurement part of the GB/T 25000 standard (e.g. GB/T 25000.22, GB/T 25000.23 Or the new measure identified in GB/T 25000.24), the user should explain the relationship between the measure and its corresponding quality model, and its How is it built from QME. Appendix C provides examples of programming QM.

Note 2: GB/T 25000.10 provides guidance on the definition and use of system and software product quality models.

6.4.1 Identify the QM that needs to be built

The quality of a system refers to the extent to which the system meets the explicit and implicit needs of various stakeholders and provides a measure of value. This standard adopts the quality model To express these explicit and implicit needs, the quality model divides the quality into a set of characteristics, and the characteristics are further decomposed into sub-features under certain circumstances.

Sex. The complete set of quality characteristics of these models is not relevant to every stakeholder. Nonetheless, every type of stakeholder should be Send a representative to review and consider the relevance of the quality characteristics in each model before finally determining a set of quality characteristics to be used, such as these quality characteristics.

Performance will be used to establish performance requirements or evaluation criteria for systems and software products.

The applicable QM is not limited to the QM listed in GB/T 25000.22, GB/T 25000.23 and GB/T 25000.24. If needed, New QM can be constructed and included in the QM set of specific features or sub-features to meet the additional quality requirements of users. new QM should be described in accordance with 6.4.2, appropriate QME should be selected, and the combination of QMEs should be used with measurement functions (see Appendix D).

Any new definition of QM, including QM modified from the various parts of the GB/T 25000 standard quality measurement, should be recorded.

The definition of QM should include the information contained in the examples provided in

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