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Information technology — Software and systems engineering — FiSMA 1.1 functional size measurement method

Technologies de l'information — Logiciel et systèmes d'ingénierie — Méthode de mesure de la taille fonctionnelle FiSMA 1.1

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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.

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 29881 was prepared by the Finnish Software Measurement Association (FiSMA) and was adopted, under the PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

Introduction

Functional size is an essential measure for comparisons of software development activities and development alternatives. Beside its uses in estimating and productivity analysis, functional size has proven to be useful in project planning, tracking, control and contracting. Because Functional Size Measurement (FSM) works best when there is a complete list of functional user requirements and services, it makes scope management and change management effective, reliable and relatively easy to understand even to the end-user.

The correctness of counting parameters and thus the usefulness of an FSM method can be evaluated based on the correlation between functional size and effort under similar environmental and technical circumstances and quality requirements. This kind of evaluation may indicate a need to justify the counting parameters used to derive functional size. FiSMA Functional Size Measurement Method Version 1.1 (referred to throughout this International Standard as simply FiSMA 1.1) is a general, parameterised functional size measurement method for all types of software. It was developed by a working group of Finnish Software Measurement Association (FiSMA), to replace the previous FSM method Experience 2.0 Function Point Analysis (FPA), which has been applied largely in Finland since 1997. More than 600 software development projects were measured using that method between 1997 and 2003.

The current values of constraints used in FiSMA 1.1 are derived from its predecessor Experience 2.0 FPA, and were confirmed statistically to be correct. They may be updated in future releases of the FiSMA FSM Method if the data collection and analysis demonstrate the need to do so.

For readers who are unfamiliar with Functional Size Measurement terminology, a review of terms is provided in Annex A, together with definitions and explanations of the most important terms.

Results from FiSMA 1.1 and Experience 2.0 FPA are largely convertible with each other, if the source data has been collected at the recommended detail level.

FiSMA 1.1 is based purely on Functional User Requirements (FUR). User requirements can be thought of as functional – what the software does, and non-functional – how the software must perform (including quality requirements). For FiSMA 1.1, the Functional User Requirements are the object of measurement. While some FSM methods are process oriented, FiSMA 1.1 is service oriented. Process oriented methods require the identification of all functional processes supported by the piece of software. In contrast, service oriented methods, such as FiSMA 1.1, require identification of all different *services* provided by the piece of software.

The FiSMA 1.1 relationship chain between users and the developed piece of software involves user needs and services as presented in Figure 1.

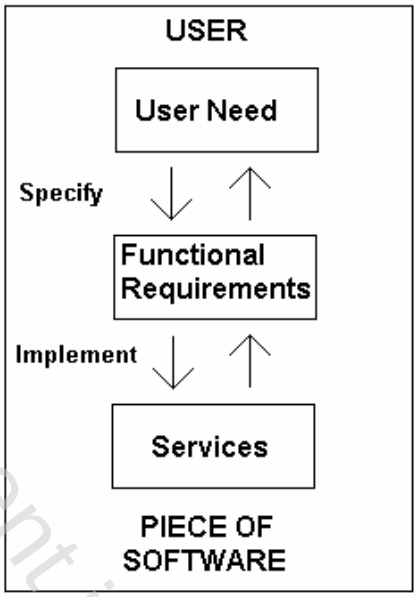

Figure 1 — Links between user and a piece of software

While each audience may have their own reasons for size measurement, the typical user viewpoint is to estimate the effort for a software project. Other important industry uses of FSM are presented in Figure 2.

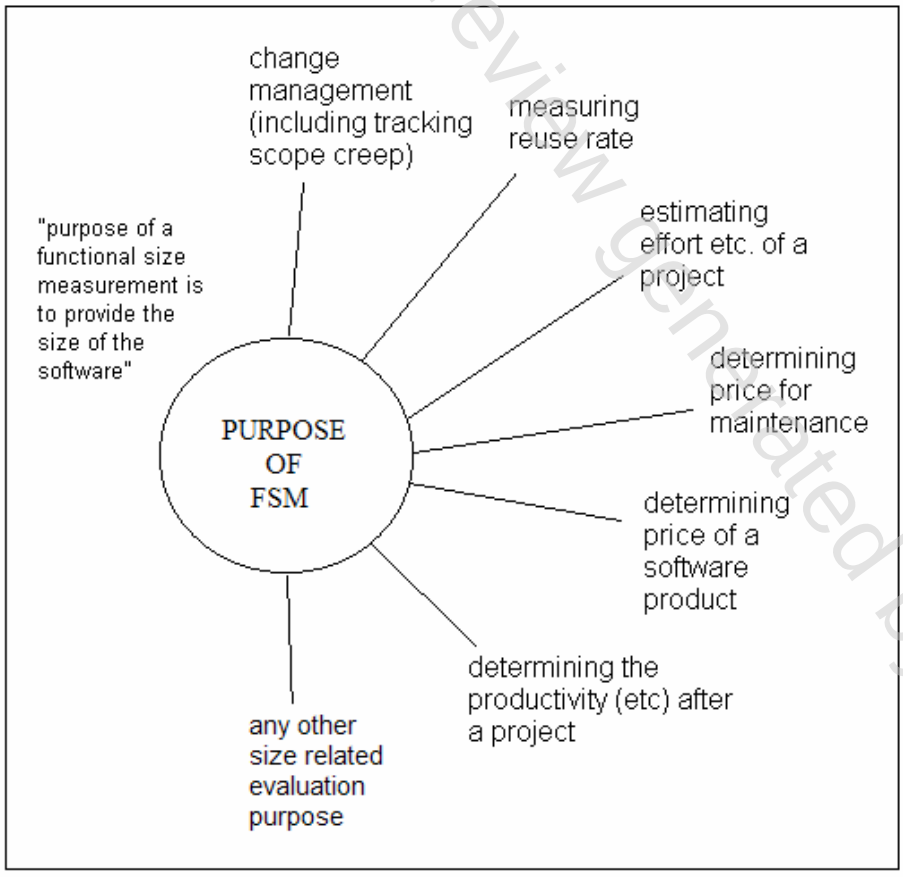

Figure 2 — Common Purposes of Functional Size Measurement

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1 Scope

This International Standard specifies the set of definitions, conventions and activities of FiSMA 1.1.

The target audience of this International Standard includes anyone who applies FiSMA 1.1 to measure the functional size of a piece of software. FiSMA 1.1 is intended for use by those persons associated with the acquisition, development, use, support, maintenance, and audit of software. FiSMA 1.1 is based on an assessment of the Functional User Requirements. It measures the functional size of a piece of software from the perspective of the users.

1.1 Field of application for FiSMA 1.1

FiSMA 1.1 is applicable to measure all software in any functional domain.

1.2 Limitations of FiSMA 1.1

FiSMA 1.1 has no limitations related to the type or quality of software to be measured.

1.3 Scope of FSM for FiSMA 1.1

The scope of the Functional Size Measurement for FiSMA 1.1 is determined by the purpose for measuring the software. When using FiSMA 1.1, the set of FUR to be included depends on the purpose of the count and thus, may include the FUR for one piece of software or a set of pieces of software. Each piece of software within the scope is measured separately and if more than one piece of software is included within a project, all of the functional sizes may be added together. The scope of the FSM instance is always a subset of the overall user requirements and includes purely the Functional User Requirements, in other words, “what” in terms of services and tasks that the software must perform. The purpose of the FSM determines which FUR will be included in the FSM instance.

NOTE 1 For example if the purpose for the FSM is to determine the size of the first release of a piece of software, then the size using FiSMA 1.1 will include only the FUR for the first release of the software.

NOTE 2 As another example,if the purpose for the FSM is to determine the supported size of an installed package, only those functional user requirements in the package that are used by the organization will be included in the instance of the FSM.

NOTE 3 FiSMA 1.1 only measures the size of the Functional User Requirements included within the scope as outlined above.

2 Normative references

The following referenced documents are indispensable for the application 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*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. Whenever a term is already defined by ISO/IEC, such as "Functional Size Measurement", the ISO definition has been adopted for this method.

3.1
BFC class
defined group of BFC types

3.2
boundary
conceptual interface between the software under study and its users

[ISO/IEC 14143-1:2007, definition 3.3]

NOTE The boundary of a piece of software to be sized using FiSMA 1.1 conceptually separates the piece and the environment in which it operates, perceived from the external user perspective. The boundary provides the measurement analyst(s) with a solid delimiter to distinguish, without ambiguity, what is included inside the measured software from what is part of the measured software's operating environment.

3.3
data element
unique, user recognizable, non-repeated field in a BFC

NOTE 1 A data element can be a character string, or a digital or graphical element in a BFC.

NOTE 2 When "data elements" are indicated for a BFC, the number of data elements is always greater than 0.

3.4
data store
organized and persistent collection of data and information that allows for its retrieval

[ISO/IEC 15939:2002]

3.5
end-user
any person that communicates or interacts with the software at any time

3.6
Functional Services
base functional components (BFC) defined by FiSMA 1.1

3.7
operation
arithmetic or logical operation performed in an algorithmic and manipulation BFC

NOTE The number of operations is always greater than 0.