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Foreword

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This document was prepared by the Object Management Group (OMG) (as the OMG specification for Automated Function Points (AFP), v1.0) and drafted in accordance with its editorial rules. It was adopted, under the JTC 1 PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

This document is related to:

— ITU-T Recommendation X.902 (1995) | ISO/IEC 10746-2:1995, *Information Technology — Open Distributed Processing — Reference Model: Foundations*

— ITU-T Recommendation X.903 (1995) | ISO/IEC 10746-3:1995, *Information Technology — Open Distributed Processing — Reference Model: Architecture*

— ITU-T Recommendation X.920 (1997) | ISO/IEC 14750:1997, *Information Technology — Open Distributed Processing — Interface Definition Language*

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Introduction

The rapid growth of distributed processing has led to a need for a coordinating framework for this standardization and ITU-T Recommendations X.901-904 | ISO/IEC 10746, the Reference Model of Open Distributed Processing (RM-ODP) provides such a framework. It defines an architecture within which support of distribution, interoperability and portability can be integrated.

RM-ODP Part 2 (ISO/IEC 10746-2) defines the foundational concepts and modeling framework for describing distributed systems. The scopes and objectives of the RM-ODP Part 2 and the UML, while related, are not the same and, in a number of cases, the RM-ODP Part 2 and the UML specification use the same term for concepts which are related but not identical (e.g., interface). Nevertheless, a specification using the Part 2 modeling concepts can be expressed using UML with appropriate extensions (using stereotypes, tags, and constraints).

RM-ODP Part 3 (ISO/IEC 10746-3) specifies a generic architecture of open distributed systems, expressed using the foundational concepts and framework defined in Part 2. Given the relation between UML as a modeling language and Part 3 of the RM-ODP standard, it is easy to show that UML is suitable as a notation for the individual viewpoint specifications defined by the RM-ODP.

This International Standard defines a method for automating the counting of Function Points that is generally consistent with the Function Point Counting Practices Manual, Release 4.3.1 (IFPUG CPM) produced by the International Function Point Users Group (IFPUG). Guidelines in this specification may differ from those in the IFPUG CPM at points where subjective judgments have to be replaced by the rules needed for automation. The IFPUG CPM was selected as the anchor for this specification because it is the most widely used functional measurement specification with a large supporting infrastructure maintained by a professional organization.

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1 Scope

1.1 Purpose

This International Standard defines a method for automating the counting of Function Points that is generally consistent with the Function Point Counting Practices Manual, Release 4.3.1 (IFPUG CPM) produced by the International Function Point Users Group (IFPUG). Guidelines in this International Standard may differ from those in the IFPUG CPM at points where subjective judgments have to be replaced by the rules needed for automation. The IFPUG CPM was selected as the anchor for this International Standard because it is the most widely used functional measurement specification with a large supporting infrastructure maintained by a professional organization.

1.2 Applicability

This International Standard is applicable to the functional sizing of transaction-oriented software applications, and in particular those with data persistency. To be consistent with the IFPUG CPM, the International Standard provides details on the support of applications using relational databases. However, the International Standard can be used and extended for any type of transactional application with data persistency.

1.3 Limitations

This International Standard does not address the sizing of enhancements to an application or maintained functionality (often called Enhancement Function Points). Extensions of the automated counting methods described in this International Standard such as Automated Enhancement Function Points will be addressed in future addendums to this International Standard. This International Standard does not address sizing for the non-functional components of a software application. Non-functional components (as defined by IFPUG) include:

— Structural Quality Constraints Reliability, Security, Performance Efficiency, Maintainability, etc.

— Organizational Constraints locations for operations, target hardware, compliance to standards, etc.

— Environmental Constraints interoperability, security, privacy, safety, etc.

— Implementation Constraints development language, delivery schedule, etc.

2 Conformance and Compliance

2.1 Conformance

This International Standard is derived from IFPUG's Function Point Counting Practices Manual, Release 4.3.1 (IFPUG CPM). However, explicit counting rules were specified in this International Standard in order to provide for rigorous automation that may not be in strict conformance with guidance in IFPUG's manual. Therefore, there is no claim of strict conformance with the IFPUG CPM standard. Additionally, this International Standard has made every attempt to conform to the extent possible with international standards for functional measurement, in particular ISO/IEC 25010, ISO/IEC 20926:2009, and NEN-ISO/IEC 24570. This International Standard conforms to OMG's Knowledge Discovery Meta-model (KDM) and Structured Metrics Meta-model (SMM) in its specification and representation of the Automated Function Point counting and scoring process.

Conformance with this International Standard by Automated Function Point counting tools is determined by analyzing the KDM elements that constitute the Application Model and produce the final Automated Function Point count using the counting process specified in the SMM model presented in this International Standard. Output from this automated process should conform to the list of output artifacts listed in Clause 7.

2.2 Compliance

Implementations of this International Standard should be able to demonstrate the following attributes in order to claim compliance:

— Automated — Although the initial inputs such as the source code, definition of application boundary, and some naming conventions are provided manually to initiate Automated Function Point counting, the analysis of the source code and the actual counting must be fully automated.

— Consistent — Two independent and separate functional sizings performed on the same application source code using the same boundaries and other required manual inputs by different Automated Function Point tools that conform to this International Standard must produce the same results in terms of Automated Function Point size (i.e., the same number of Automated Function Points).

— Verifiable — Implementations that comply with this International Standard must clearly list each and every input the implementation requires and list each and every output that the implementation generates so that they can be audited by a third party. Implementations should provide a list of assumptions/heuristics (to the extent that this does not disclose proprietary information) used to transform the inputs to the outputs so that the calculations can be independently verified by third parties.

2.3 Consistency with IFPUG CPM

This International Standard for Automated Function Points follows the steps for the counting process in the IFPUG CPM to the extent possible for an automated system. An automated system relies on receiving the correct and complete list of inputs to fulfill this step. Consequently the initial step in the Automated Function Point counting process is the manual gathering of inputs and configuring them properly for analysis by the Automated Function Point counting technology. The remainder of the analysis and counting process is automated.

This International Standard prioritizes repeatability and consistency over consistency with the IFPUG CPM counting guidelines. In some counting situations, IFPUG guidelines are vague, leaving the interpretation to the judgment of the counter. Consequently, IFPUG certified Function Point counters often differ by as much as 10 % or more in the counts they produce. In order to remove subjectivity, this International Standard makes explicit decisions about counting techniques in situations where the IFPUG guidelines were vague. Consequently we have introduced some variation from the IFPUG guidelines in order to achieve the precision required for automation and repeatability.

Automated Function Point counts may differ from the manual counts produced by IFPUG Certified Function Point counters. In fact, manual counts produced by different IFPUG Certified Function Point counters on the same code base will typically differ because of different interpretations of the designer's or developer's intent in creating various functional elements of an application. In the manual IFPUG counting process, documentation, and expert knowledge are typically used in sizing an application. These types of inputs are not available to an automated system. Hence, any automated approach will be unable to capture information about the designer's or developer's intent that isn't explicitly encoded in the application's source code. Since this International Standard relies exclusively on the application's source code as defined by its boundaries, it cannot capture any of the designer's intentions that do not leave an 'imprint' on the source code. Some of these intentions might make a difference in manual counting. For this additional reason, the Automated Function Point counts produced by technology that is compliant with this International Standard may differ from manual counts produced by IFPUG Certified Function Point counters. The advantage of Automated Function Points is that a tool will produce repeatable, consistent counts, attributes that are not characteristic of manual counting.

3 References

3.1 Normative

The following normative documents contain provisions which, through reference in this text, constitute provisions of this Automated Function Point International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply.

— Structured Metrics Meta-model, version 1.0 (SMM), formal/2012-01-05

— Knowledge Discovery Meta-model, version 1.3 (KDM), formal/2011-08-04

— Unified Modeling Language, version 2.4.1 (UML), formal/2011-08-05

— MOF/XMI Mapping, version 2.4.1 (XMI), formal/2011-08-09

3.2 Non-normative

— Function Point Counting Practices Manual, Release 4.3.1. ISBN 978-0-9753783-4-2

— Function Point Analysis. ISBN 0-201-69944-3