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Systems and software engineering — Measurement process

Ingénierie des systèmes et du logiciel — Processus de mesure

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Foreword

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Introduction

Measurement supports the management and improvement of processes and products. Measurement is a primary tool for managing system and software life cycle activities, assessing the feasibility of project plans, and monitoring the adherence of project activities to those plans. System and software measurement is also a key discipline in evaluating the quality of products and the capability of organizational processes. It is becoming increasingly important in two-party business agreements, where it provides a basis for specification, management, and acceptance criteria.

Continual improvement requires change within the organization. Evaluation of change requires measurement. Measurement itself does not initiate change. Measurement should lead to action and not be employed purely to accumulate data. Measurements should have a clearly defined purpose.

This document defines a measurement process applicable to system and software engineering and management disciplines. The process is described through a model that defines the activities of the measurement process that are required to adequately specify what measurement information is required, how the measures and analysis results are to be applied, and how to determine if the analysis results are valid. The measurement process is flexible, tailorable, and adaptable to the needs of different users.

The measurement process defined in this document, while written for system and software domains, can be applied in other domains.

The purpose of this document is to describe the activities and tasks that are necessary to successfully identify, define, select, apply and improve measurement within an overall project or organizational measurement structure. It also provides definitions for measurement terms commonly used within the system and software disciplines.

This document does not catalog measures, nor does it provide a recommended set of measures to apply on projects. It does identify a process that supports defining a suitable set of measures that addresses specific information needs.

This document is intended to be used by suppliers and acquirers. Suppliers include personnel performing management, technical and quality management functions in system and software development, maintenance, integration and product support organizations. Acquirers include personnel performing management, technical and quality management functions in procurement and user organizations.

The following are examples of how this document can be used:

— by a supplier to implement a measurement process to address specific project or organizational information requirements;

— by an acquirer (or third-party agents) for evaluating conformance of the supplier's measurement process to this document;

— by an acquirer (or third-party agents) to implement a measurement process to address specific technical and project management information requirements related to the acquisition;

— in a contract between an acquirer and a supplier as a method for defining the process and product measurement information to be exchanged.

Systems and software engineering — Measurement process

1 Scope

This document establishes a common process and framework for measurement of systems and software. It defines a process and associated terminology from an engineering viewpoint. The process can be applied to the project and products across the life cycle. The measurement process can be applied throughout the life cycle to aid the planning, managing, assessing, and decision-making in all stages of a system or software life cycle.

This document also provides activities that support the definition, control and improvement of the measurement process used within an organization or a project.

This document does not assume or prescribe an organizational model for measurement. The user of this document decides, for example, whether a separate measurement function is necessary within the organization and whether the measurement function should be integrated within individual projects or across projects, based on the current organizational structure, culture and prevailing constraints.

This document does not prescribe a specific set of measures, method, model or technique. The users of this document are responsible for selecting a set of measures for the project and defining the application of those measures across the process, products, and other elements of the life cycle. The parties are also responsible for selecting and applying appropriate methods, models, tools and techniques suitable for the project.

This document is not intended to prescribe the name, format, explicit content, or recording media of the information items to be produced. This document does not imply that documents be packaged or combined in some fashion. These decisions are left to the user of this document. ISO/IEC/IEEE 15289 addresses the content for life cycle process information items (documentation).

The measurement process is supposed to be appropriately integrated with the organizational quality system. Not all aspects of internal audits and non-compliance reporting are covered explicitly in this document as they are assumed to be in the domain of the quality system.

This document is not intended to conflict with any organizational policies, standards or procedures that are already in place. However, any conflict should be resolved and any overriding conditions and situations need to be cited in writing as exceptions to the application of this document.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO, IEC and IEEE maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEEE Standards Dictionary Online: available at http://ieeexplore.ieee.org/xpls/dictionary.jsp

NOTE Definitions for other terms typically can be found in ISO/IEC/IEEE 24765, available at <www.computer.org/sevocab>.