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Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Guidance for quality evaluation of artificial intelligence (AI) systems

Ingénierie des systèmes et des logiciels — Exigences et évaluation de la qualité des systèmes et des logiciels (SQuaRE) — Lignes directrices pour l'évaluation de la qualité des systèmes d'intelligence artificielle (IA)

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 42, *Artificial intelligence*.

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Introduction

An artificial intelligence (AI) system can be challenging to evaluate. Consequently, the impact of an AI system with poor quality can be considerable since it can be developed to facilitate the automation of critical actions and decisions.

The purpose of this document is to guide AI developers performing a quality evaluation of their AI systems. This document does not state exact measurements and thresholds, as these vary depending on the nature of each system. Instead, it specifies comprehensive guidance that covers the relevant facets of an AI system's quality for successful quality evaluation.

Testing is within the scope as far as each characteristic and sub-characteristic is verified by testing strategies, but details of testing methods and measurements are covered elsewhere, for example in the ISO/IEC/IEEE 29119 series.

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Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Guidance for quality evaluation of artificial intelligence (AI) systems

1 Scope

This document provides guidance for evaluation of artificial intelligence (AI) systems using an AI system quality model.

The document is applicable to all types of organizations engaged in the development and use of AI.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 TS 4213, *Information technology — Artificial intelligence — Assessment of machine learning classification performance*

ISO/IEC 22989, *Information technology — Artificial intelligence — Artificial intelligence concepts and terminology*

ISO/IEC 23053:2022, *Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML)*

ISO/IEC 25059:2023, *Software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Quality model for AI systems*

ISO/IEC/IEEE 29119-1, *Software and systems engineering — Software testing — Part 1: General concepts*

ISO/IEC/IEEE 29148, *Systems and software engineering — Life cycle processes — Requirements engineering*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC TS 4213, ISO/IEC 22989, ISO/IEC 23053, ISO/IEC 25059, ISO/IEC/IEEE 29119-1 and ISO/IEC/IEEE 29148 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

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

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

4 Overview

To ensure that relevant facets of an AI system's quality are covered by the quality evaluation guidance, this document references Systems and software Quality Requirements and Evaluation (SQuaRE) product quality and quality in use models' characteristics for an AI system (see ISO/IEC 25059). The product quality and quality in use models' characteristics, as applicable to a general system, apply to an AI system. Several sub-characteristics have been added, and some have different meanings or contexts.

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