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Australian/New Zealand Standard™

Software and systems engineering — Certification of software and systems engineering professionals

Part 1: General requirements



AS/NZS ISO/IEC 24773.1:2022

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- Australian Digital Health Agency
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- Engineers Australia
- Griffith University
- IT Service Management Forum Australia
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Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT-015, Software and Systems Engineering, to supersede AS/NZS ISO/IEC 24773:2013, *Software engineering—Certification of software engineering professionals—Comparison framework*.

The objective of this document is to set out the requirements which will be common to all other parts of the ISO/IEC 24773 series, for certifications (schemes and bodies) in the domain of software and systems engineering.

This document is identical with, and has been reproduced from, ISO/IEC 24773-1:2019, *Software and systems engineering — Certification of software and systems engineering professionals — Part 1: General requirements*.

As this document has been reproduced from an International document, a full point substitutes for a comma when referring to a decimal marker.

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see <http://patents.iec.ch>).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html. This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 07, *Software and systems engineering*.

This first edition cancels and replaces ISO/IEC 24773:2008 which has been technically revised.

The main changes compared to the previous edition are as follows:

- normative reference has been made to ISO/IEC 17024, for general requirements related to certifications and the certification of persons;
- a statement of general requirements or recommendations applicable to both software and systems engineering has been added;
- a separation of software-engineering-specific requirements from the generic requirements has been made;
- additional requirements for certifications in systems engineering have been included;
- additional recommendations concerning bodies of knowledge which form one element of a certification scheme have been added; and
- additional guidance concerning the description of skills and competencies has been added.

A list of all parts in the ISO/IEC 24773 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Over the past several decades, software systems have become critical components of most aspects of life. At the same time, these systems have become increasingly complex. One response to this situation has been the recognition and codification of effective practices for systems and software development processes and products. This effort has led to the development of systems and software engineering standards by ISO and IEC, by professional societies, and by national standards bodies. It has also led to the definition of an internationally-recognized body of knowledge for software engineering^[5] and systems engineering^[8].

The increasing globalization of the industry implies that a systems engineering or software engineering professional is likely to work in different countries over the course of a career. Currently individuals around the world are working in these domains and they possess varying levels of knowledge and skill. However, there is no single certification which is recognized for these domains – there are many certifications and they differ in several respects.

It is therefore important to develop certifications for these domains which are more meaningful, more readily comparable, and which are recognized internationally. An International Standard which contains minimum requirements for the scope and content of certifications for professionals in these domains can increase confidence in those certifications which conform to that International Standard.

Because conforming certifications meet the requirements contained in this document, the standard can improve the recognition and acceptance of those certifications in countries and jurisdictions around the world. This increased acceptance and recognition in turn can enhance the mobility of the professionals holding a conforming certification.

This document responds to the needs of organizations that require software or systems engineers whose skills and competence are attested by a certification that conforms to an International Standard.

At present, different countries have adopted different approaches regarding the required skills and knowledge for professionals working in these domains – these may be implemented by means of regulations and laws. The establishment of certifications for professionals in these domains, and the definition for minimum requirements for such schemes are not intended to interfere with or override such national regulations and laws. A certification for professionals in these domains, as described in this document is not a licence to practice in any jurisdiction. However, licensing bodies and regulators may consider various certifications of individual persons. The intention of this document is to be open to these national approaches by providing a framework for expressing them in a common scheme that can lead to understanding between different countries.

This document is part one of ISO/IEC 24773 (all parts), a multi-part standard that revises and replaces ISO/IEC 24773:2008. The existing version of ISO/IEC 24773:2008 was intended to be used as a framework for the comparison of certifications for software engineering professionals.

Many qualifications and some certifications exist for systems and software engineering. There is currently no International Standard that defines the minimum requirements for such schemes. This new revision of ISO/IEC 24773 addresses the certification of professionals in software engineering and systems engineering.

ISO/IEC 17024 is a base standard containing general requirements for bodies performing certification of persons. The revised ISO/IEC 24773 (all parts) contains requirements specifically related to certifications for software and systems engineering professionals. ISO/IEC 24773 (all parts) also contains guidance to certification bodies regarding the definition of knowledge, skill and competence that are to be incorporated into a certification for such professionals. ISO/IEC 24773 (all parts) is intended to be used in combination with ISO/IEC 17024.

ISO/IEC 24773 (all parts) is useful to industry organizations seeking to compare various certifications for professionals in systems and/or software engineering; to individual professionals seeking to obtain certification; and to employers who may choose or recognize such certifications. Such comparison is important for the society and for various types of stakeholders, since many disparate certification

schemes currently exist in this domain and since each scheme defines its own competence scheme. A comparison framework facilitates the comparison between certifications and thus encourages certification providers to engage in continuous improvement of a certification. An engineer or an organization can also benefit from a comparison framework, because they can choose a certification which is appropriate for their skill/career development needs and their current level of achievement.

ISO/IEC 24773 (all parts) is useful to certification bodies offering schemes in the domain of systems/software engineering, as it contains minimum requirements for the certification, and conformance to ISO/IEC 24773 (all parts) can help the conforming certification to be globally accepted and recognized. The document is useful to many stakeholder groups since it can help to promote clear consistent standards for knowledge, skill and competence that are applicable to professionals in these domains.

ISO/IEC 24773 (all parts) is also useful to bodies offering qualifications in the domain of systems/software engineering. Qualifications, as defined in ISO/IEC 24773 (all parts), cannot claim conformance to ISO/IEC 24773 (all parts) because they do not address one or more of the minimum requirements defined for certification. However, the various requirements defined in ISO/IEC 24773 (all parts) can be used as a comparison framework for certification and qualification schemes. Thus, it becomes possible for a user of ISO/IEC 24773 (all parts) to examine and clarify the differences between various certification and qualification schemes. Such comparison is important from the viewpoint of society in general and from the viewpoint of various types of stakeholders, since many certification and qualification schemes exist in this domain. In addition, such a comparison framework can facilitate comparisons by both certification bodies and their customers. So, the existence of a comparison framework can encourage competition and continuous improvement of a qualification scheme. Using ISO/IEC 24773 (all parts) as a comparison framework, an engineer or an organization can more readily select certifications or qualifications that are appropriate to their needs.

ISO/IEC 24773 (all parts) consists of the following parts:

- ISO/IEC 24773-1, *Software and Systems Engineering — Certification of Software and Systems Engineering Professionals — Part I: General Requirements*
 - ISO/IEC 24773-1 serves as the basis for the revised multipart 24773 standard. It contains terminology, concepts and requirements that are common to the remaining parts.
- ISO/IEC 24773-2, *Software and Systems Engineering — Certification of Software and Systems Engineering Professionals — Part II: Guidance Regarding Description of Knowledge, Skill and Competence in Certification and Qualification Schemes*
 - ISO/IEC 24773-2 (under preparation) provides guidance and recommendations that may be used by certification or qualification bodies regarding the description of knowledge, skill and competence within their particular schemes.
- ISO/IEC 24773-3, *Software and Systems Engineering — Certification of Software and Systems Engineering Professionals — Part III: Systems Engineering*
 - ISO/IEC 24773-3 (under preparation) provides specific requirements for certification schemes and certification bodies in systems engineering.
- ISO/IEC 24773-4, *Software and Systems Engineering — Certification of Software and Systems Engineering Professionals — Part IV: Software Engineering*
 - ISO/IEC 24773-4 (under preparation) provides specific requirements for certification schemes and certification bodies in software engineering.

ISO/IEC 24773 (all parts) is applicable across all organizations and is useful to certification or qualification bodies and consumers (potential certificants, employers and IT service users) who are comparing or evaluating various certification or qualification schemes.

ISO/IEC 24773 (all parts) references and uses as a normative base the general concepts and basic requirements related to the certification and qualification of persons. ISO/IEC 17024 is used and