INTERNATIONAL STANDARD

ISO/IEC 29110-4-1

Second edition
2018-04

Systems and software engineering — Lifecycle profiles for Very Small Entities (VSEs) —

Part 4-1: Software engineering - Profile specifications: Generic profile group

Ingénierie des systèmes et du logiciel — Profils de cycle de vie pour très petits organismes (TPO) —

Partie 4-1: Ingénierie du logiciel - Spécification de profil: Groupe de profil générique

Reference number
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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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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.

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).

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

For an explanation on 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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

This second edition cancels and replaces the first edition (ISO/IEC 29110-4-1:2011), which has been technically revised. The main changes compared to the previous edition are as follows:

— the title of Clause 6 was changed from “Description of Basic VSE profiles” to “Profile Specification and its conformance with base Standards;

— Clause 8 was replaced by Annex A “Basic profile base document references”;

— Basic profile specifications (Clause 7) have been changed to requirements;

— mapping tables to “task requirements” of ISO/IEC 12207 have been included; and

— informative Annex B “Base profile Process Reference Model” was added.

A list of all parts in the ISO/IEC 29110 series is available on the ISO and IEC websites.

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Introduction

Very Small Entities (VSEs) around the world are creating valuable products and services. For the purpose of ISO/IEC 29110, a VSE is an enterprise, an organization, a department or a project having up to 25 people. Since many VSEs develop and/or maintain system and software components used in systems, either as independent products or incorporated in larger systems, a recognition of VSEs as suppliers of high quality products is required.

According to the Organization for Economic Co-operation and Development (OECD) SME and Entrepreneurship Outlook report (2005) 'Small and Medium Enterprises (SMEs) constitute the dominant form of business organization in all countries world-wide, accounting for over 95 % and up to 99 % of the business population depending on country'. The challenge facing governments and economies is to provide a business environment that supports the competitiveness of this large heterogeneous business population and that promotes a vibrant entrepreneurial culture.

From studies and surveys conducted, it is clear that the majority of International Standards do not address the needs of VSEs. Implementation of and conformance with these standards is difficult, if not impossible. Consequently, VSEs have no, or very limited, means to be recognized as entities that produce quality systems/system elements including software in their domain. Therefore, VSEs are excluded from some economic activities.

It has been found that VSEs find it difficult to relate International Standards to their business needs and to justify the effort required to apply standards to their business practices. Most VSEs can neither afford the resources, in terms of number of employees, expertise, budget and time, nor do they see a net benefit in establishing over-complex systems or software life cycle processes. To address some of these difficulties, a set of guidelines have been developed based on a set of VSE characteristics. The guidelines are based on subsets of appropriate standards processes, activities, tasks, and outcomes, referred to as profiles. The purpose of a profile is to define a subset of International Standards relevant to the VSE context; for example, processes, activities, tasks, and outcomes of ISO/IEC/IEEE 12207 for software; and processes, activities, tasks, and outcomes of ISO/IEC/IEEE 15288 for systems; and information products (documentation) of ISO/IEC/IEEE 15289 for software and systems.

VSEs can achieve recognition through implementing a profile and by being audited against ISO/IEC 29110 standards.

The ISO/IEC 29110 series of International Standards and Technical Reports can be applied at any phase of system or software development within a life cycle. This series of International Standards and Technical Reports is intended to be used by VSEs that do not have experience or expertise in adapting/tailoring ISO/IEC/IEEE 12207 or ISO/IEC/IEEE 15288 standards to the needs of a specific project. VSEs that have expertise in adapting/tailoring ISO/IEC/IEEE 12207 or ISO/IEC/IEEE 15288 are encouraged to use those International Standards instead of the ISO/IEC 29110 series.

ISO/IEC 29110 is intended to be used with any lifecycle such as: waterfall, iterative, incremental, evolutionary or agile.

Systems, in the context of ISO/IEC 29110, are typically composed of hardware and software components.

The ISO/IEC 29110 series, targeted by audience, has been developed to improve system or software and/or service quality, and process performance. See Table 1.

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Table 1 — ISO/IEC 29110 target audience

ISO/IEC 29110	Title	Target audience
Part 1	Overview	VSEs and their customers, assessors, standards producers, tool vendors and methodology vendors.
Part 2	Framework for profile preparation	Profile producers, tool vendors and methodology vendors. Not intended for VSEs.
Part 3	Certification and Assessment guidance	VSEs and their customers, assessors, accreditation bodies.
Part 4	Profile specifications	VSEs, customers, standards producers, tool vendors and methodology vendors.
Part 5	Management, engineering and service delivery guidelines	VSEs and their customers.

If a new profile is needed, ISO/IEC 29110-4 and ISO/IEC TR 29110-5 can be developed with minimal impact to existing documents.

ISO/IEC TR 29110-1 defines the terms common to the set of the ISO/IEC 29110 series. It introduces processes, lifecycle and standardization concepts, the taxonomy (catalogue) of ISO/IEC 29110 profiles and the ISO/IEC 29110 series. It also introduces the characteristics and needs of a VSE, and clarifies the rationale for specific profiles, documents, standards and guidelines.

ISO/IEC 29110-2-1 introduces the concepts for systems and software engineering profiles for VSEs. It establishes the logic behind the definition and application of profiles. For standardized profiles, it specifies the elements common to all profiles (structure, requirements, conformance, assessment). For domain-specific profiles (profiles that are not standardized and developed outside of the ISO process), it provides general guidance adapted from the definition of standardized profiles.

ISO/IEC 29110-3 defines certification schemes, assessment guidelines and compliance requirements for process capability assessment, conformity assessments, and self-assessments for process improvements. ISO/IEC 29110-3 also contains information that can be useful to developers of certification and assessment methods and developers of certification and assessment tools. ISO/IEC 29110-3 is addressed to people who have direct involvement with the assessment process, e.g. the auditor, certification and accreditation bodies and the sponsor of the audit, who need guidance on ensuring that the requirements for performing an audit have been met.

ISO/IEC 29110-4-m provides the specification for all profiles in one profile group (a profile group may contain a single profile or multiple profiles). A profile is specified in terms of requirements imported from appropriate base standards.

ISO/IEC/TR 29110-5-m-n provides management, engineering and service delivery guidelines for the profiles in a profile group.

This document provides the specification for the Basic profile in the profile group of Software Engineering. It is based on subsets of appropriate standards elements.

Figure 1 describes the ISO/IEC 29110 series of International Standards (IS) and Technical Reports (TR) and positions the parts within the framework of reference. Overview, assessment guidelines, management and engineering guidelines are available from ISO as freely available Technical Reports (TR). The Framework document, profile specifications and certification schemes are published as International Standards (IS).

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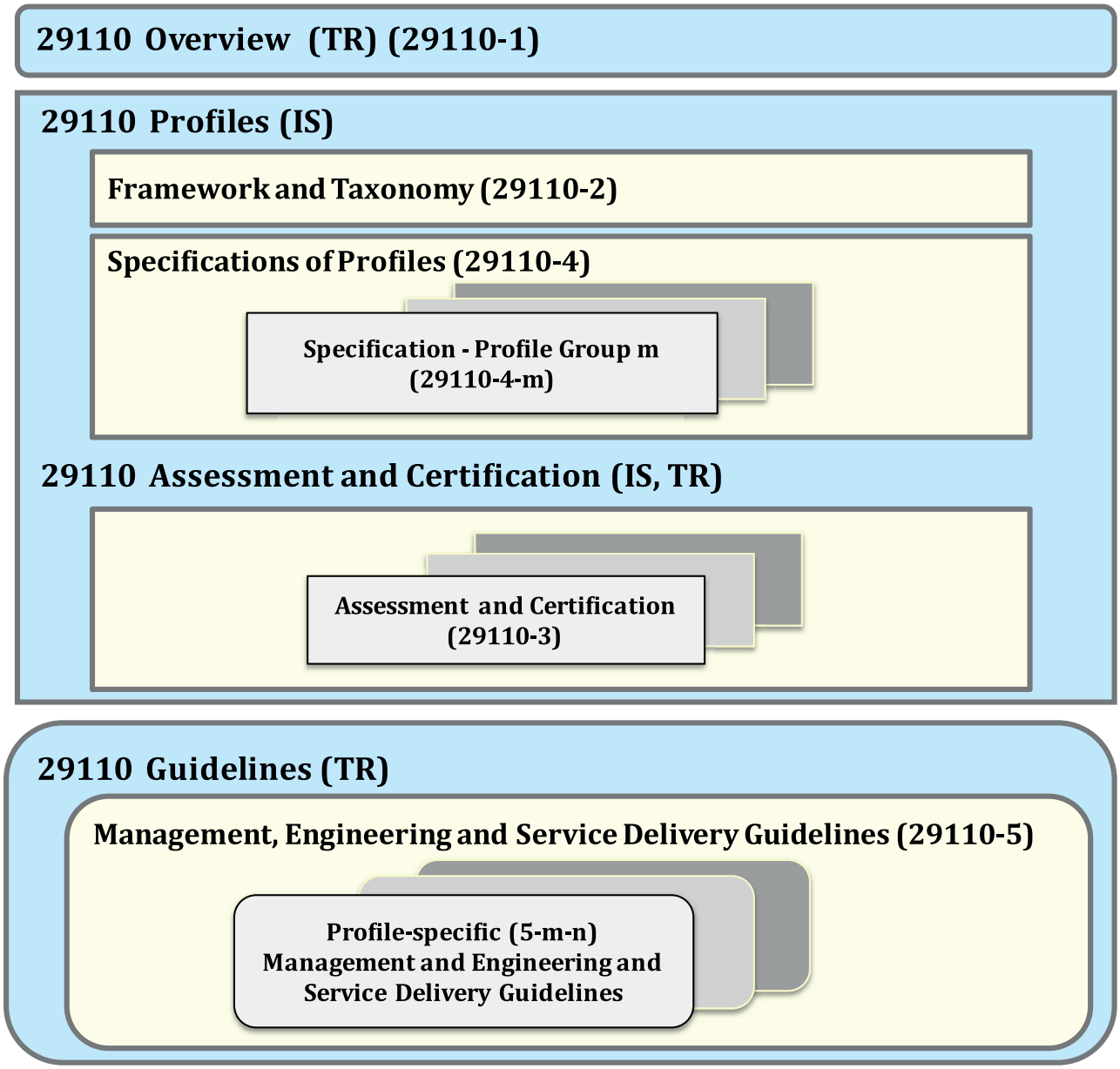


Figure 1 — ISO/IEC 29110 Series

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Systems and software engineering — Lifecycle profiles for Very Small Entities (VSEs) —

Part 4-1:
Software engineering - Profile specifications: Generic profile group

1 Scope

The ISO/IEC 29110 series is applicable to Very Small Entities (VSEs). VSEs are enterprises, organizations, departments or projects having up to 25 people. The lifecycle processes described in the ISO/IEC 29110 series are not intended to preclude or discourage their use by larger organizations than VSEs.

The lifecycle processes defined in the ISO/IEC 29110 series can be used by VSEs when using, as well as when creating and supplying, a software system. They can be applied at any level in a software system's structure and at any stage in the lifecycle. The processes described in the ISO/IEC 29110 series are not intended to preclude or discourage the use of additional processes that VSEs find useful. This document is not intended to preclude the use of different life cycles such as: waterfall, iterative, incremental, evolutionary or agile.

This document provides a profile specification for the Basic profile. The Basic profile applies to VSEs involved in software development. It selects ISO/IEC/IEEE 12207 project management and software implementation process elements from the single project perspective.

This document provides the normative and informative links to the subset of ISO/IEC/IEEE 12207.

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 29110-2-1, *Software engineering — Lifecycle profiles for Very Small Entities (VSEs) — Part 2-1: Framework and taxonomy*

ISO/IEEE 12207:2008, *Systems and software engineering — Software life cycle processes*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 29110-2-1 apply.

ISO and IEC 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 https://www.iso.org/obp

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3.2 Abbreviated terms

PAM Process Assessment Model

PM Project Management

PRM Process Reference Model

SI Software Implementation

VSE Very Small Entity

4 Conformance

4.1 Conformance situations

This document can be implemented by organizations or projects implementing and using the processes required by this document. Therefore, organizations can claim conformance to this document.

This document does not contain any requirements applicable to products that facilitate its implementation and its use within organizations. Therefore, conformance cannot be claimed by developers of products.

NOTE Examples of such products are methods, courses, teaching aids, tools, and forms.

This document can be attested by a third party. It can be mandated as part of procurement and contractual processes.

4.2 Conformance to this document

A VSE that claims conformance to the profile specified in this document shall identify the Software Engineering Basic Profile as the profile it has implemented.

It can claim conformance to the process part of the profile if it meets all the mandatory profile process requirements as identified in its specification Clause 7, and the associated properties and requirements as described in the base standards when applicable.

NOTE Requirements of this document are mandatory and use the word "shall".

5 Naming, diagramming and definition conventions

Conventions for naming, diagramming, describing and defining VSE Profiles are defined in ISO/IEC 29110-2-1.

6 Profile specification and its conformance with base standards

6.1 Minimal conditions for Basic profile use

To use the Basic profile, it is assumed that the VSE already fulfils the following conditions:

a) There is a project contract or agreement with scope.

b) The cost, technical and schedule feasibility was performed before the project start.

c) The project working team, including project manager, is assigned and trained.

d) Goods, services and infrastructure are available.

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