TECHNICAL REPORT

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

Part 5-6-2: Systems engineering — Management and engineering guide: Generic profile group: Basic profile

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

Partie 5-6-2: Ingénierie des systèmes — Guide d'ingénierie et de gestion: Groupe de profil générique: Profil basique

Reference number
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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 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

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

The full list of parts of ISO/IEC 29110 is available here.

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Introduction

Very Small Entities (VSEs) around the world are contributing to valuable products and services. For the purpose of ISO/IEC 29110, a Very Small Entity (VSE) is an enterprise, an organization, a department or a project having up to 25 people. Since many VSEs develop and/or maintain system elements and software components used in systems, or sold to be used by others, 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 OECD governments 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. Subsequently VSEs have no, or very limited, ways to be recognized as entities that produce quality systems/system elements including software in their domain. Therefore, VSEs are often cut off 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 application of 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 systems or software lifecycle processes. To rectify some of these difficulties, a set of guides has been developed according to a set of VSE characteristics. The guides 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 VSEs' context; for example, processes, activities, tasks, and outcomes of ISO/IEC 12207[2] for software; and processes, activities, tasks, and outcomes of ISO/IEC 15288[3] for systems; and information products (documentation) of ISO/IEC/IEEE 15289[4] for software and systems.

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

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

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

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	Standards producers, tool vendors and methodology vendors. Not intended for VSEs.
Part 3	Certification and Assessment guide	VSEs and their customers, assessors, accreditation bodies.
Part 4	Profile specifications	Standards producers, tool vendors and methodology vendors.
Part 5	Management and engineering guide	VSEs and their customers.

If a new profile is needed, ISO/IEC 29110-4 and ISO/IEC TR 29110-5 can be developed without impacting existing documents.

ISO/IEC TR 29110-1[5] defines the terms common to the Set of ISO/IEC 29110 Documents. 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 requirements of a VSE, and clarifies the rationale for specific profiles, documents, standards and guides.

ISO/IEC 29110-2[6] introduces the concepts for systems and software engineering standardized profiles for VSEs. It establishes the logic behind the definition and application of profiles. It specifies the elements common to all profiles (structure, conformance, assessment) of ISO/IEC 29110 profiles.

ISO/IEC TR 29110-3[7] defines the process certification scheme, assessment guidelines and compliance requirements needed to meet the purpose of the defined Profiles. ISO/IEC TR 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 TR 29110-3 is addressed to people who have direct relation 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 that are based on subsets of appropriate standards elements.

This part of ISO/IEC 29110 provides a management and engineering guide for each Profile in one profile group.

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

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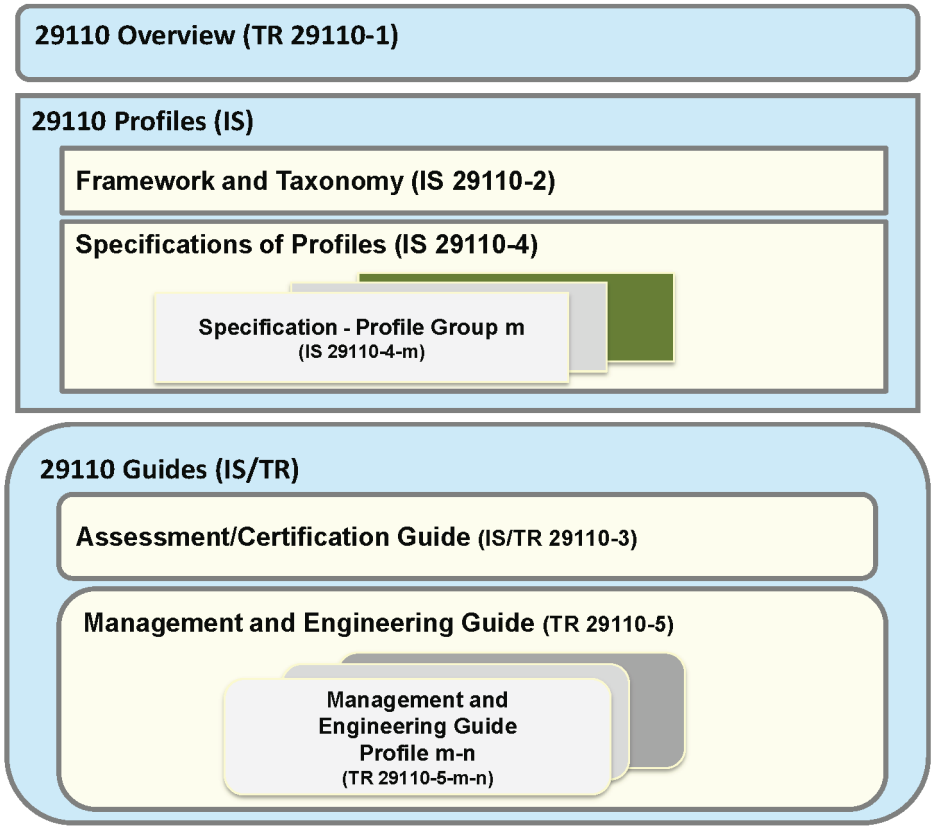


Figure 1 — ISO/IEC 29110 Series

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

Part 5-6-2:
Systems engineering — Management and engineering guide: Generic profile group: Basic profile

1 Scope

1.1 Fields of application

This part of ISO/IEC 29110 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 set of International Standards (IS) and Technical Reports (TR) are not intended to preclude or discourage their use by organizations bigger than VSEs.

This part of ISO/IEC 29110 provides the management and engineering guide to the Basic Profile described in ISO/IEC 29110-4-6 through Project Management and System Definition and realization processes. This part of ISO/IEC 29110 is a standalone guide; it is not intended for a VSE to use the standardized profile to implement this part of ISO/IEC 29110.

This part of ISO/IEC 29110 applies for non-critical systems development projects. The system development should fulfil the project requirements and the system description.

Using this part of ISO/IEC 29110, a VSE can obtain benefits in the following aspects:

— An agreed set of project requirements (technical part of contract) and expected products are agreed by the Acquirer.

— A disciplined management process, that provides project visibility and corrective actions of project problems and deviations, is performed.

— A systematic System Definition and Realization process, that satisfies Acquirer needs and ensures quality products, is followed.

VSEs developing software that is part of a larger system, and for stand-alone software products and services, are encouraged to use the management and engineering guide of the Basic Profile (ISO/IEC 29110-5-1-2[9]).

1.2 Target Audience

This part of ISO/IEC 29110 is targeted at VSEs who do not develop critical systems and do not have experience with SE process planning and implementation using ISO/IEC 15288.

It is intended to be used with any processes, techniques and methods that enhance the VSE's Stakeholder satisfaction and productivity.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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ISO/IEC TR 29110-1, *Software engineering — Lifecycle profiles for Very Small Entities (VSEs) — Part 1: Overview*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC TR 29110-1:2011 and the following apply.

3.1
acquirer
stakeholder that acquires or procures a product or service from a supplier

Note 1 to entry: Other terms commonly used for an acquirer are buyer, customer, owner, or purchaser.

[SOURCE: ISO/IEC 15288:2008]

3.2
critical system
those items (e.g. functions, parts, software, characteristics, processes) having significant effect on the product realization and use of the product – including safety, performance, form, fit, function, producibility, service life, etc. – that require specific actions to ensure they are adequately managed

Note 1 to entry: Examples of critical items include safety critical items, fracture critical items, mission critical items, key characteristics, etc.

[SOURCE: (AS/EN/JIS Q) 9100:2009]

3.3
disposed system
system that has been transformed (i.e. state change) by applying the disposal process

Note 1 to entry: A systems approach considers the total system and the total lifecycle of the system. This includes all aspects of the system and the system throughout its life until the day users depose of the system and the external enterprises complete the handling of the disposed system products.

[SOURCE: ISO/IEC 15288:2008, modified]

3.4
operator
entity that performs the operations of a system

Note 1 to entry: The role of operator and the role of user may be vested, simultaneously or sequentially, in the same individual or organization.

Note 2 to entry: An individual operator combined with knowledge, skills and procedures may be considered as an element of the system.

Note 3 to entry: In the context of this specific definition, the term entity means an individual or an organization.

[SOURCE: ISO/IEC 15288:2008]

3.5
Systems Engineering Plan
SEP
top-level plan for managing the SE effort which, as such, defines how the project will be organized, structured, and conducted and how the total engineering process will be controlled to provide a product that satisfies stakeholder requirements

Note 1 to entry: Also called Systems Engineering Management Plan (SEMP).

[SOURCE: INCOSE:2010]

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