TECHNICAL REPORT

ISO/IEC

TR

29110-3

Software engineering — Lifecycle profiles for Very Small Entities (VSEs) —

Part 3:
Assessment guide

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

Partie 3: Guide d'évaluation

iTeh STANDARD PREVIEW
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ISO/IEC TR 29110-3:2011
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

In exceptional circumstances, when the joint technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide to publish a Technical Report. A Technical Report is entirely informative in nature and shall be subject to review every five years in the same manner as an International Standard.

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.

ISO/IEC TR 29110-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

ISO/IEC 29110 consists of the following parts, under the general title *Software engineering — Lifecycle profiles for Very Small Entities (VSEs)*:

⎯ *Part 1: Overview* [Technical Report]

⎯ *Part 2: Framework and taxonomy*

⎯ *Part 3: Assessment guide* [Technical Report]

⎯ *Part 4-1: Profile specifications: Generic profile group*

⎯ *Part 5-1-2: Management and engineering guide: Generic profile group: Basic profile* [Technical Report]

Entry profile, intermediate profile and advanced profile will form the subjects of future Parts 5-1-1, 5-1-3 and 5-1-4, respectively.

Parts 4 and 5 can be developed to accommodate new profile specifications and management and engineering guides as follows:

⎯ *Part 4-m: Profile specifications: Profile group aaaaa*

⎯ *Part 5-m-n: Management and engineering guide: Profile group aaaaa: Profile bbbbb* [Technical Report]

Introduction

The software industry recognizes the value of Very Small Entities (VSEs) in contributing valuable products and services. For the purpose of ISO/IEC 29110, a Very Small Entity (VSE) is an entity (enterprise, organization, department or project) having up to 25 people. VSEs also develop and/or maintain software that is used in larger systems; therefore, recognition of VSEs as suppliers of high quality software is often required.

According to the Organization for Economic Co-operation and Development (OECD) SME and Entrepreneurship Outlook report (2005) '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. 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 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 the standards to their business practices. Most VSEs can neither afford the resources, in terms of number of employees, budget and time, nor do they see a net benefit in establishing 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 elements, referred to as VSE Profiles. The purpose of a VSE Profile is to define a subset of International Standards relevant to the VSE context, for example, processes and outcomes of ISO/IEC 12207 and products of ISO/IEC 15289.

ISO/IEC 29110, targeted by audience, has been developed to improve product and/or service quality, and process performance. See Table 1. ISO/IEC 29110 is not intended to preclude the use of different lifecycles such as: waterfall, iterative, incremental, evolutionary or agile.

Table 1 — ISO/IEC 29110 target audience

ISO/IEC 29110	Title	Target audience
Part 1	Overview	VSEs, assessors, standards producers, tool vendors and methodology vendors
Part 2	Framework and taxonomy	Standards producers, tool vendors and methodology vendors. Not intended for VSEs.
Part 3	Assessment guide	Assessors and VSEs
Part 4	Profile specifications	Standards producers, tool vendors and methodology vendors. Not intended for VSEs.
Part 5	Management and engineering guide	VSEs

If a new profile is needed, ISO/IEC 29110-4 and ISO/IEC TR 29110-5 can be developed without impacting existing documents and they become ISO/IEC 29110-4-*m* and ISO/IEC 29110-5-*m-n*, respectively, through the ISO/IEC process.

ISO/IEC TR 29110-1 defines the business terms common to the ISO/IEC 29110 series. It introduces processes, lifecycle and standardization concepts, and the ISO/IEC 29110 series. It also introduces the characteristics and requirements of a VSE, and clarifies the rationale for VSE-specific profiles, documents, standards and guides.

ISO/IEC 29110-2 introduces the concepts for software engineering standardized profiles for VSEs, and defines the terms common to the ISO/IEC 29110 series. It establishes the logic behind the definition and application of standardized profiles. It specifies the elements common to all standardized profiles (structure, conformance, assessment) and introduces the taxonomy (catalogue) of ISO/IEC 29110 profiles.

This part of ISO/IEC 29110 defines the process assessment guidelines and compliance requirements needed to meet the purpose of the defined VSE Profiles. This part of ISO/IEC 29110 also contains information that can be useful to developers of assessment methods and assessment tools. This part of ISO/IEC 29110 is addressed to people who have direct relation with the assessment process, e.g. the assessor and the sponsor of the assessment, who need guidance on ensuring that the requirements for performing an assessment have been met.

ISO/IEC 29110-4-*m* provides the specification for all the profiles in one profile group that are based on subsets of appropriate standards elements. VSE Profiles apply and are targeted to authors/providers of guides and authors/providers of tools and other support material.

ISO/IEC TR 29110-5-*m-n* provides an implementation management and engineering guide for the VSE Profile described in ISO/IEC 29110-4-*m*.

Figure 1 describes the ISO/IEC 29110 series and positions the parts within the framework of reference. Overviews and guides are published as Technical Reports (TR), and profiles are published as International Standards (IS).
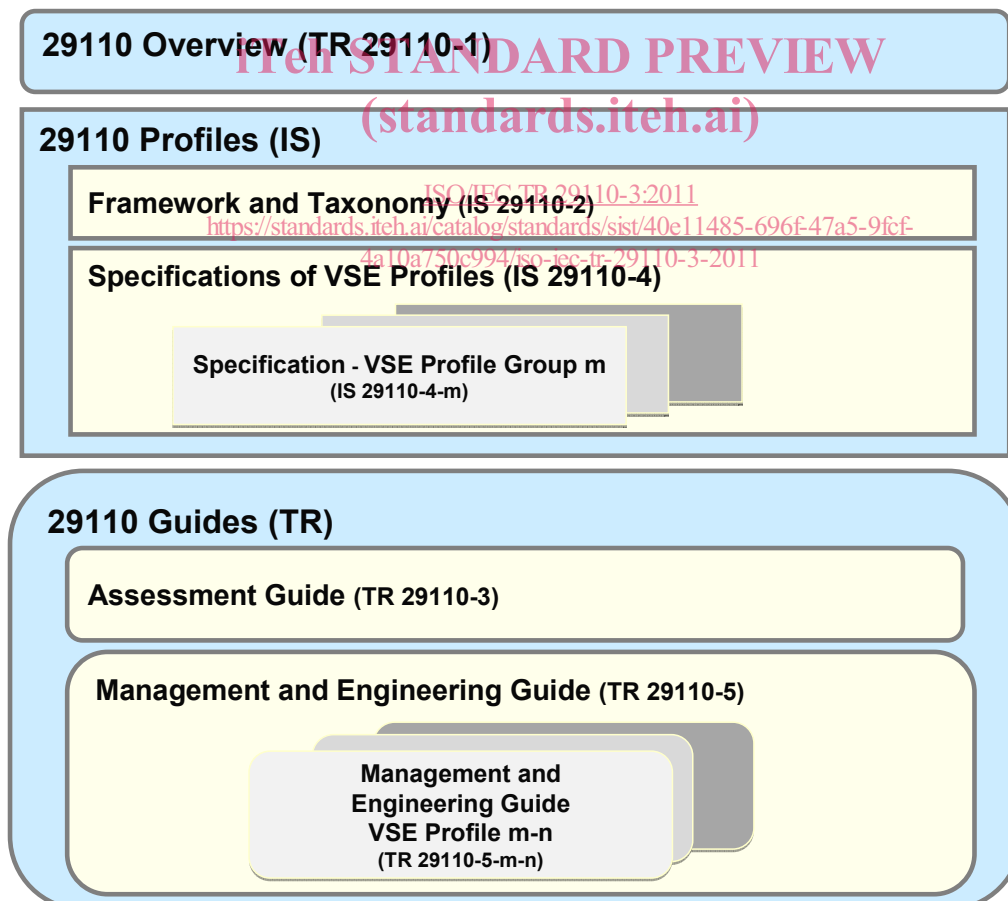

Figure 1 — ISO/IEC 29110 series

Software engineering — Lifecycle profiles for Very Small Entities (VSEs) —

Part 3:
Assessment guide

1   Scope

1.1   Fields of application

This part of ISO/IEC 29110 defines the process assessment guidelines and conformance requirements needed to meet the purpose of defined VSE Profiles. It is applicable to all VSE Profiles and is compatible with ISO/IEC 15504-2.

The possible uses of this part of ISO/IEC 29110 are as follows.

a)   Assessment to evaluate the process capabilities. This is when an organization wants an assessment execution in order to obtain a process profile of the implemented processes.

b)   Provider's capability assessment. This is when a customer asks for a third party to conduct an assessment in order to obtain a process profile of the implemented process by the software development and maintenance provider. The customer chooses the processes to be assessed depending on the services to be contracted.

1.2   Target audience

The target audience of this part of ISO/IEC 29110 is primarily those who perform process assessments for VSEs. This part of ISO/IEC 29110 also contains information that can be useful to developers of assessment methods and assessment tools.

This part of ISO/IEC 29110 is addressed to people who have a direct relation with the assessment process based on the VSE Profiles, e.g. the assessor and the sponsor of the assessment, who need guidance on ensuring that the requirements for performing an assessment have been met.

It is intended that ISO/IEC TR 29110-1 and ISO/IEC 29110-2 be read first when initially exploring VSE Profile documents.

2   Normative references

The following referenced documents are indispensable for the application 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 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 apply.

4 Conventions and abbreviated terms

4.1 Naming, diagramming and definition conventions

None.

4.2 Abbreviations

VSE   Very Small Entity

VSEs   Very Small Entities

5 Assessment framework

These guidelines apply to VSE Process Assessments. The assessment, as defined in this part of ISO/IEC 29110 and in the Standardized Profiles for VSE, has two purposes:

1) To evaluate the process capability based on a two dimensional assessment model containing a process dimension and a capability dimension. The process dimension refers to the processes defined in each VSE Profile which are provided by an external Process Reference Model. The capability dimension consists of a Measurement Framework comprising six Process Capability Levels and their associated Process Attributes.

2) To evaluate whether an organization achieves the targeted VSE Profile based on the evaluated capabilities for the processes.

For any official recognition, the assessments should be carried out following an assessment process satisfying the requirements of ISO/IEC 15504-2 and described in Clause 6 of this part of ISO/IEC 29110. For self-assessments emphasizing identification of process improvements, other approaches can be applied (additional information can be found in ISO/IEC 29110-5).

According to ISO/IEC 15504-2, a process assessment is a disciplined evaluation of an organizational unit's processes against a Process Assessment Model. In this context, the Process Assessment Model consists of a subset of process purposes and outcomes of a Process Reference Model, and the process attributes that are defined in ISO/IEC 15504-2:2003. A Process Reference Model is, for instance, ISO/IEC 12207:2008 and the applicable subset is defined in a Specification of a VSE Profile, for instance, ISO/IEC 29110-4-1. The applied Process Assessment Model needs to be conformant to ISO/IEC 15504-2. The result of a process assessment is represented as a set of process attribute ratings, i.e. a process profile. Figure 2 illustrates the relevant documents and data for a process applicable to VSE process assessment.
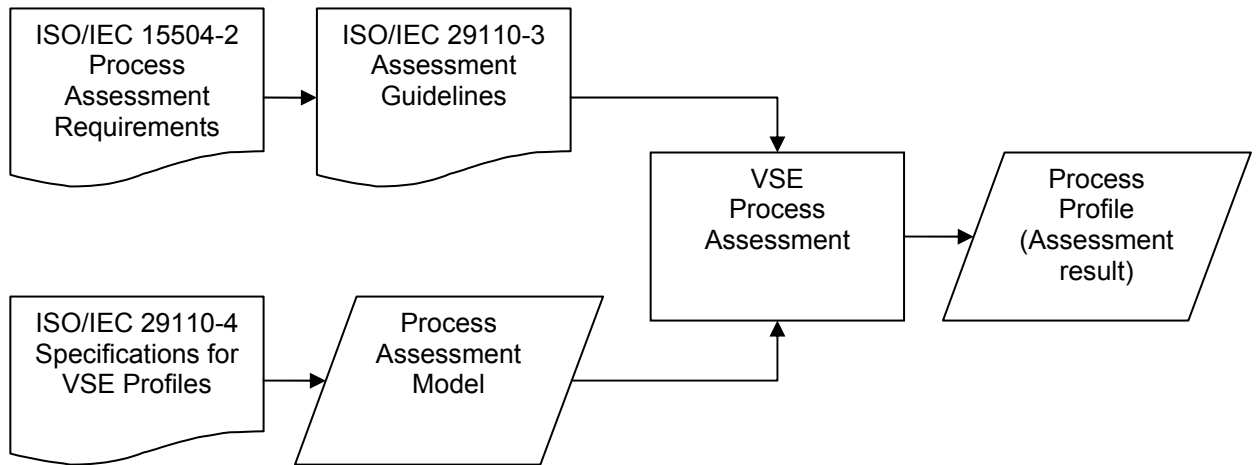
Figure 2 — Elements of VSE process assessment

ISO/IEC 15504-2 sets out the minimum requirements for performing an assessment that ensure consistency and repeatability of the ratings. The requirements help to ensure that the assessment output is self-consistent and provides evidence to substantiate the ratings and to verify conformance with the requirements. Detailed guidance on performing an assessment is available in ISO/IEC 15504-3:2003.

Self-assessments are typically performed to identify process improvement opportunities or to check current status of the organization's performance. Self-assessments in VSEs are outside the scope of this part of ISO/IEC 29110.

6 VSE process assessment

6.1 Performing an assessment

6.1.1 Introduction

In performing an assessment based on ISO/IEC 29110, the requirements expressed in ISO/IEC 15504-2 are intended to be satisfied in full. The assessors should be familiar with the intent of these requirements and the guidance provided in ISO/IEC 15504-3. This clause of ISO/IEC 29110-3 provides additional guidance related specifically to the process assessment in VSEs.

An assessment is conducted according to a documented process that is capable of meeting the assessment purpose. The key elements of a documented assessment process are closely tied to the requirements for performing an assessment, defined in Clause 4 of ISO/IEC 15504-2:2003. The documented assessment process is the set of instructions for conducting the assessment. A documented assessment process addresses the following aspects of the conduct of an assessment:

— defining the inputs to an assessment such as purpose, scope, constraints and the identity of the conformant Process Assessment Model to be used;

— defining key roles and responsibilities;

— providing guidance for planning, data collection, data validation, process attributes rating and reporting of assessment results;

— recording of assessment outputs.