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Systems and software engineering — Life cycle profiles for very small entities (VSEs) —

Part 5-4: Agile software development guidelines

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

Partie 5-4: Lignes directrices relatives au développement de logiciels agiles

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Foreword

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

A list of all parts in the ISO/IEC 29110 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

0.1 Introduction to the ISO/IEC 29110 series

For the purpose of the ISO/IEC 29110 series, a very small entity (VSE) is an enterprise, organization (e.g. government agency, non-profit organization), department or 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.

VSEs around the world are creating valuable products and services. According to the World Bank, small and medium-sized enterprises (SMEs) account for about 90 % of enterprises worldwide. According to the Organisation for Economic Co-operation and Development (OECD), SMEs represent 99 % of all businesses and generate about 60 % of employment. Almost one person out of three is employed in a micro firm with less than 10 employees. The European Union reports that micro firms, with fewer than 10 persons, account for 93,5 % of all enterprises and small firms, with 10 to 49 employees, account for 5,5 % of all enterprises. The challenge facing 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, the majority of International Standards do not address the needs of VSEs. Implementation of and conformity with these standards is difficult, if not impossible.

Consequently, 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 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 find it helpful to have detailed, specified, procedures when beginning agile projects, rather than attempting to interpret and tailor the more flexible, high-level process requirements of ISO/IEC/IEEE. To address some of these difficulties, a set of guidelines have been developed based on a set of VSEs 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 VSEs' context; for example, processes, activities, tasks, and outcomes of ISO/IEC/IEEE 12207 for software systems; 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 specifications.

The ISO/IEC 29110 series can be applied at any phase of system or software development within a life cycle. The ISO/IEC 29110 series 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 standards instead of the ISO/IEC 29110 series.

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

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

The ISO/IEC 29110 series, targeted by audiences, has been developed to improve system or software and/or service quality, and process performance. Figure 1 describes the ISO/IEC 29110 series and positions the parts within the framework of reference.

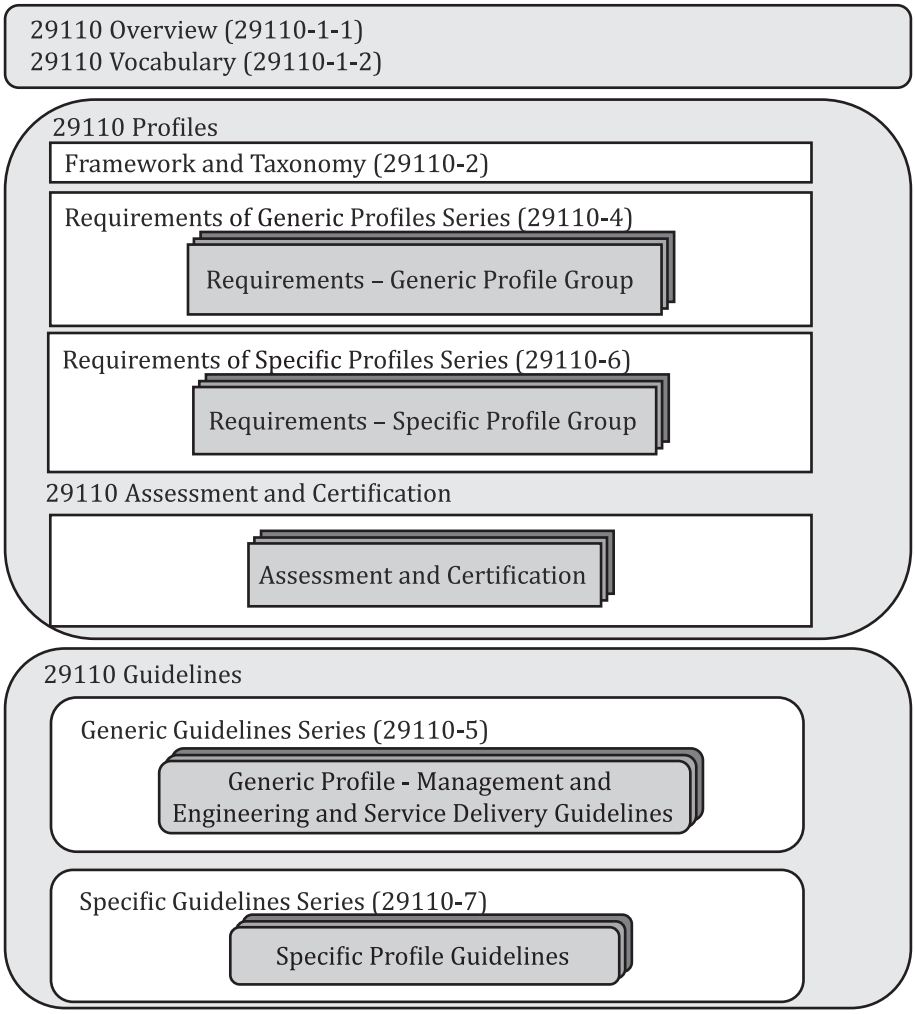

Figure 1 — ISO/IEC 29110 series

ISO/IEC 29110-1-1 introduces processes, life cycle and standardization concepts, the taxonomy (catalog) of ISO/IEC 29110 profiles and the ISO/IEC 29110 series. ISO/IEC 29110-1-1 also introduces the characteristics and needs of a VSE, and clarifies the rationale for specific profiles, documents, standards and guidelines. ISO/IEC 29110-1-2 defines the terms common to the ISO/IEC 29110 series. ISO/IEC 29110-1-1 and ISO/IEC 29110-1-2 are targeted at VSEs and their customers, assessors, standards producers, tool vendors and methodology vendors.

ISO/IEC 29110-2 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, conformity, and 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 29110-2 is targeted at profile producers, tool vendors and methodology vendors.

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 29110-3 is targeted at VSEs and their customers, assessors, accreditation bodies.

ISO/IEC 29110-4 provides the specifications for all generic profiles of the Generic profile group that are based on subsets of appropriate standards elements. ISO/IEC 29110-4 is targeted at VSEs, customers, standards producers, tool vendors and methodology vendors.

ISO/IEC 29110-5 provides management, engineering and service delivery guidelines for profiles of the Generic profile group. ISO/IEC 29110-5 is targeted at VSEs and their customers.

ISO/IEC 29110-6 provides the specifications for specific profiles that are based on subsets of appropriate standards elements. ISO/IEC 29110-6 is targeted at VSEs, customers, standards producers, tool vendors and methodology vendors.

ISO/IEC 29110-7 provides guidelines for each profile of the specific profile group. ISO/IEC 29110-7 is targeted at VSEs and their customers.

If a new profile is needed, ISO/IEC 29110-4 or ISO/IEC 29110-6 and or ISO/IEC 29110-7, ISO/IEC 29110-5 can be developed with minimal impact to existing documents.

0.2 Introduction to this document

This document aims to help VSEs that want to reinforce their agile environment to develop software products using an agile approach with practices of the ISO/IEC 29110 series. Therefore, it can be implemented by organizations or projects that are implementing and using an agile environment and want to reinforce it using the processes and products recommended by this document.

This document provides examples of work products templates (see Annex A).

This document is based mainly on the scrum and XP agile methods (see Annex B).

This document also aims to help VSEs that want to initiate a certification of the two processes of the software Basic profile of the ISO/IEC 29110, as specified in ISO/IEC 29110-4-1, while performing their agile practices (see Annex C).

This document has been developed, using the management and engineering guidelines of the ISO/IEC 29110-5-1-2 software Basic profile, by modifying and adding elements (e.g. task, work product, role) for VSEs involved in the development of software using an agile approach (see Annex C). However, this document does not contain any requirements; and organizations cannot claim conformity to this document.

Using this document, VSEs can obtain the following benefits:

— project planning: by providing a set of events to enable the team to track the work and know what an impediment can be and assign tasks to each member of the team;

— effort estimation: by providing estimation techniques for the sprint planning event;

— progress tracking: by providing tools (e.g. burndown chart, product backlog, daily scrum) to update and track the work, the budget and the schedule until the project's closure;

— management of changes and artefacts: by providing a set of tasks to control the changes to the software and management work products;

— clarity of each role: by providing a set of tasks for each role;

— agile risk management: by providing work products to identify and manage risks;

— reduced rework: by providing a set of tasks that minimize errors and handle the detection and correction of defects effectively.

Systems and software engineering — Life cycle profiles for very small entities (VSEs) —

Part 5-4:
Agile software development guidelines

1 Scope

This document provides guidelines for very small entities (VSEs) that want to reinforce their agile environment to develop software using an agile approach with practices of the ISO/IEC 29110 series.

This document is applicable to VSEs that do not develop business- or safety-critical products.

2 Normative references

The following documents are referred to in the text in such a way that some or all 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 29110-1-2, *Systems and software engineering — Lifecycle profiles for Very Small Entities (VSEs) — Part 1-2: Vocabulary*