

# Chapter 65

## The Development of International Standards to Facilitate Process Improvements for Very Small Entities

**Claude Y. Laporte**

*École de Technologie Supérieure, Canada*

**Edgardo Palza Vargas**

*École de Technologie Supérieure, Canada*

### **ABSTRACT**

*Industry recognizes that Very Small Entities (VSEs) that develop software are very important to the economy. A Very Small Entity (VSE) is an entity (enterprise, organization, department or project) with up to 25 people..Failure to deliver a quality product on time and within budget threatens the competitiveness of VSEs and impacts their customers. One way to mitigate these risks is to put in place proven software engineering practices. Many international standards and models, like ISO/IEC 12207 or CMMI®1, have been developed to capture proven engineering practices. However, these documents were not designed for VSEs and are often difficult to apply in such settings. This chapter presents a description of the development of process improvement international standards (IS) targeting VSEs developing or maintaining software as a standalone product or software as a component of a system. The documents used by ISO/IEC JTC1/SC72 Working Group 24 (WG24), mandated to develop a set of standards and guides, and the approach that led to the development, balloting of the ISs, and TRs (Technical Reports) for VSEs are also presented. The chapter focuses on the ISO/IEC 29110 Standard<sup>3</sup>, the development of means to help VSEs improve their processes, and the description of a few pilot projects conducted to implement the processes of ISO/IEC 29110 standard.*

DOI: 10.4018/978-1-4666-4301-7.ch065

## **INTRODUCTION**

Most software engineering centers, such as the Software Engineering Institute (SEI), dedicate a large portion of their resources to large organizations. Even though there seems to be an awareness of the needs of Very Small Entities (VSEs), a VSE is an entity (enterprise, organization, department or project) with up to 25 people, published software engineering practices are still for the most part difficult to use by organizations with up to 25 people. A few centers around the world are focusing their Software Process Improvement (SPI) activities on small enterprises and VSEs. Some centers and initiatives and their accomplishments in helping VSEs are discussed in (Laporte, Alexandre, & O'Connor, 2008; Laporte, Alexandre, & Renault, 2008; Oktaba et al., 2007; Laporte, April, & Renault, 2005; Habra, Alexandre, Desharnais, Laporte, & Renault, 2008).

Since a standard from the International Organization for Standardization (ISO) dedicated to software life cycle processes was already available, i.e. ISO/IEC 12207 (ISO/IEC 12207, 2008), WG24 decided to use the concept of the ISO Standardized Profile (SP) to develop the new standards for VSEs. A profile is defined as “a set of one or more base standards and/or SPs, and, where applicable, the identification of chosen classes, conforming subsets, options and parameters of those base standards, or SPs necessary to accomplish a particular function” (ISO/IEC TR 10000-1, 1998). From a practical point of view, a profile is a matrix that identifies the elements that are taken from existing standards from those that are not to produce a Standardized Profile. The overall approach followed by WG24 to develop this standard for VSEs consisted of six steps:

- Select, from existing standards, process subsets applicable to VSEs;
- Develop a roadmap to help VSE grow their capabilities;

- Tailor the subset to fit VSE needs;
- Develop International Standard (ISs) and Technical Report (TRs);
- Produce guides which are easy to understand, affordable, and usable by VSEs;
- Develop means to accelerate the adoption and implementation of the ISs and TRs.

In the next section, the standards that have been used by WG24 to develop the ISs and TRs for VSEs are described.

## **STANDARDS USED TO DEVELOP STANDARDS FOR VSES**

### **ISO/IEC 12207: Software Life Cycle Processes<sup>4</sup>**

ISO/IEC 12207 establishes a framework for software life cycle processes and terminology: “It applies to the acquisition of systems and software products and services, to the supply, development, operation, maintenance, and disposal of software products and the software portion of a system, whether performed internally or externally to an organization” (ISO/IEC 12207, 2008). This standard defines two sets of processes (see Figure 1): in one of these, called Software Specific Processes, the final product is a standalone software product or service, and in another, called System Context Processes, the software is part of a larger system. Since most modern systems are controlled by software, this standard has been updated in 2008 to ‘interface’ with the equivalent standard at the systems engineering level: ISO/IEC 15288:2008 Systems engineering – Systems life cycle processes (ISO/IEC 15288, 2008).

Each ISO 12207 process is described in terms of the following attributes, as defined in ISO TR 24774 (ISO/IEC TR 24774, 2010):

25 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:  
[www.igi-global.com/chapter/development-international-standards-facilitate-process/77760](http://www.igi-global.com/chapter/development-international-standards-facilitate-process/77760)

## Related Content

---

### Platform Independent Analysis of Probabilities on Multithreaded Programs

Yuting Chen (2013). *International Journal of Software Innovation* (pp. 48-65).

[www.irma-international.org/article/platform-independent-analysis-of-probabilities-on-multithreaded-programs/103281](http://www.irma-international.org/article/platform-independent-analysis-of-probabilities-on-multithreaded-programs/103281)

### LDAP Vulnerability Detection in Web Applications

Hossain Shahriar, Hisham Haddad and Pranahita Bulusu (2017). *International Journal of Secure Software Engineering* (pp. 31-50).

[www.irma-international.org/article/ldap-vulnerability-detection-in-web-applications/204523](http://www.irma-international.org/article/ldap-vulnerability-detection-in-web-applications/204523)

### Behavior Studies of Nonlinear Fractional-Order Dynamical Systems Using Bifurcation Diagram

Karima Rabah (2018). *Advanced Synchronization Control and Bifurcation of Chaotic Fractional-Order Systems* (pp. 166-189).

[www.irma-international.org/chapter/behavior-studies-of-nonlinear-fractional-order-dynamical-systems-using-bifurcation-diagram/204800](http://www.irma-international.org/chapter/behavior-studies-of-nonlinear-fractional-order-dynamical-systems-using-bifurcation-diagram/204800)

### Calculating Quantitative Integrity and Secrecy for Imperative Programs

Tom Chothia, Chris Novakovic and Rajiv Ranjan Singh (2015). *International Journal of Secure Software Engineering* (pp. 23-46).

[www.irma-international.org/article/calculating-quantitative-integrity-and-secrecy-for-imperative-programs/136465](http://www.irma-international.org/article/calculating-quantitative-integrity-and-secrecy-for-imperative-programs/136465)

### Experience with Automatic Product Derivation of Mobile Applications Using Model-Driven Techniques

Elder Cirilo, Uirá Kulesza, Mário Torres and Carlos Lucena (2012). *Handbook of Research on Mobile Software Engineering: Design, Implementation, and Emergent Applications* (pp. 113-123).

[www.irma-international.org/chapter/experience-automatic-product-derivation-mobile/66463](http://www.irma-international.org/chapter/experience-automatic-product-derivation-mobile/66463)