Chapter 2
Analysis of the Evolution of Eight VSEs Using the ISO/IEC 29110 to Reinforce Their Agile Approaches

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ABSTRACT

Most very small entities (VSEs) develop software for medium and large companies and organizations. This situation creates an opportunity for them to become key players in the production chain by providing quality software within schedule and budget. A feature of most VSEs is that they do not have experience in the implementation of engineering standards due to specific features such as lack of support, lack of resources, time-consuming, and the use of agile approaches. This chapter presents an analysis of a set of eight VSEs that used agile approaches to develop software and that have implemented the software Basic profile of the ISO/IEC 29110 to reinforce their agile approach. The results show that ISO/IEC 29110 were easily implemented and helped VSEs to improve their agile approaches while helping them to understand the importance of formalizing some key artifacts produced during the development of a software product.

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INTRODUCTION

Nowadays Very Small Entities (VSEs), which can be an enterprise, an organization (e.g. public or non-profit organization), a project or a department having up to 25 people (ISO/IEC, 2011), are a key element in the software development chain since they develop software for most medium and large companies and organizations such as government agencies.

This fact motivates VSEs to develop quality software products to keep its competitiveness in the software industry. However, most of the time they do not have experience in the implementation of models and/or engineering standards due to their specific features such as lack of support, lack of resources and time-consuming (Muñoz, et al., 2019).

Besides, most VSEs prefer the use agile approaches to develop software (Muñoz, et al., 2017) because they believe that the use of proven software engineering practices is not appropriate for their environments, this fact contributes to inefficiencies in the development of software such as quality, cost and time.

Moreover, the implementation of proven practices of software quality models and standards in real environments of software development organizations, especially in VSEs represent an actual challenge (Sánchez-Gordon, de Amescua, O'Connor, & Larrucea, 2017) (Larrucea, O'Connor, Colomo-Palacios, & Laporte, 2016) (Muñoz, et al., 2019b).

As a solution, the ISO Working Group 24 developed the ISO/IEC 29110 series of standards and guides, which aims to help VSEs in the implementation of proven practices related to the Project Management Process and Systems or Software Implementation Process (Laporte & O'Connor, 2017).

However, the lack of knowledge and experience in the implementation and use of proven practices provided by quality models and standards becomes a common barrier in VSEs.

One of the main features of the ISO/IEC 29110 standard is that it can be adapted to the development cycle of most VSEs. Therefore, this chapter aims to present an analysis of a set of trials in eight VSEs that used agile approaches to develop software and that implemented the software Basic profile of the ISO/IEC 29110 to reinforce their agile approach.

After the introduction, this chapter is structured as follows: section 2 presents the background of this research composed of key concepts as well as related research works; section 3 shows the evolution of the eight VSEs that reinforced their agile approaches using the software Basic profile of the ISO/IEC 29110; section 4 presents the benefits obtained and difficulties that the VSEs encountered during the reinforcement of their agile approaches; section 5 provides the next steps of this research, including the development of an ISO/IEC 29110 agile guide; finally, section 6 presents the conclusions.

Background

This section covers 2 concepts in which this research work is based, i.e., the ISO/IEC 29110 series and agile approaches. Besides, the section provides a set of related works in which the benefits of the implementation of ISO/IEC 29110 are provided.