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Lessons from a Pilot Implementation of ISO/IEC 29110 in a Group of Very Small Irish Companies

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Abstract. This paper presents an overview of a pilot implementation of the ISO/IEC 29110 standard, with a group of very small software development companies based in Ireland. This paper may serve as guidance for both researchers and practitioners wishing to understand the issues of process standards adoption by very small companies and ISO/IEC 29110 in particular.

Keywords: SPI, VSE, process standards, ISO/IEC 29110.

1 Introduction

The term Very Small Entities (VSEs) has been defined as being “*an enterprise, organization, department or project having up to 25 people*” [1]. VSEs have unique characteristics, which make their business styles different to SMEs and therefore most of the management processes are performed through a more informal and less documented manner [2]. The new standard ISO/IEC 29110 “Lifecycle profiles for Very Small Entities” is aimed at meeting the specific needs of VSEs [3]. The overall objective of this new standard is to assist and encourage small software organization in assessing and improving their software process and it is predicted that this new standard could encourage and assist small software companies in assessing their software development process. The approach [4] used to develop ISO/IEC 29110 started with the pre-existing international standards ISO/IEC 12207 and ISO/IEC 15504. To assist VSEs with understanding and adopting the standard some members of the ISO/IEC JTC1/SC7 Working Group have produced a set of “Deployment Packages” (DP), which are a set of artifacts developed to facilitate the implementation of a set of practices, of the selected framework, in a VSE. A DP is not a process reference model (i.e. it is not prescriptive). The elements of a typical DP are: description of processes, activities, tasks, roles and products, template, checklist, example, reference and mapping to standards and models, and a list of tools. These packages are designed such that a VSE can implement its content, without having to implement the complete framework at the same time [5].

This paper outlines the process undertaken with a group of 7 VSEs located in Ireland, in terms of introducing the ISO/IEC 29110 standard to them, their learning about this standard and to participation in a training programme to apply it in their companies.

2 Objectives and Process

In October 2011 an open meeting with Irish VSEs was held, with the assistance of Enterprise Ireland, a government organization responsible for the development and growth of Irish enterprises. The purpose of this meeting was to invite small companies to learn about the ISO/IEC 29110 standard (basic profile part 5-1-2) and decide if they wanted to participate in a training programme to apply it in their companies. The specific objectives for this pilot programme were threefold:

1. To determine if a small Irish company, perhaps a start-up, can actually follow the processes defined by the standard from early in their business life to do them correctly from the beginning
2. To determine the effectiveness of group implementation with only e-mail exchanges between company and mentors
3. To get Irish companies using the standard as part of the global pilot project

In order to implement as lightweight and flexible a process as possible, it was agreed that all work was to be conducted through e-mail exchanges only, although the possibility of a final site visit and assessment was suggested once the entire standard had been implemented in a company. It was further agreed that the participating companies would address ISO/IEC processes separately (version control, project management, requirements analysis, architecture and detailed design, construction and unit testing, integration and tests, product delivery, verification and validation).

In total 7 companies expressed interest in joining the programme. A preliminary self-assessment, including questions about the company's intentions and ability to work on implementation of the standard, was conducted.

The method used in each company followed 4 basic steps:

1. VSEs were sent a deployment package and other supporting other materials.
2. VSEs implement the process and report on activities, successes and problems to the researchers.
3. The researchers review the reports and return any useful comments to the companies.
4. The researchers make any amendment to the process to ensure greater success with the next process module.

3 Outcomes

After a period of three months, four of the participating companies reported they had paused in applying the standard but hoped to return to it, one pulled out of the programme and one restarted work on the standard and submitted documents in July. One never started after an initial expression of interest. Based on the 4 stages described above, Table 1 shows the number of companies involved in each stage/task of the programme. As described in section 2 above, this programme had 3 primary objectives in terms of assessing ISO/IEC 29110 in Irish VSEs. Here we briefly revise these objectives in terms of achievement:

1. After our experiences with more complex standards such as the CMM/CMMI and SPICE, this seemed like such a simple standard it would nearly come as

second nature to install. This didn't turn out to be the case. Some of the questions asked by the companies showed what seemed fairly straightforward on the printed page, could get much more complicated in a development environment. However, two companies are progressing well, if delayed, so it can be done.

2. We have worked with companies for standards implementation but that has included regular meetings and sometimes training classes with the companies. Working with e-mail only was not as effective. It was difficult to maintain momentum without deadlines, and they were difficult in this environment where everyone was moving at their own pace and in their own direction. But again, two companies are proceeding.
3. This has mixed results for the above reasons. Some companies simply dropped out of sight and we had no way to know why or how to help them if e-mails were not returned.

Stage and Task	No. of VSEs
1. Initial assessment	7 companies
2. Version control package sent	7 companies
3. Report on version control returned	3 companies
4. Project management package sent	3 companies
5. Status report returned in March	5 companies
6. Project management & requirements documents returned for review	1 company
7. Draft final report sent with comments requested	2 companies

Table 1. Programme results

Reporting on successes and failures in actual practice is essential for research. In the case of this programme, it has been difficult to get these reports. In seeking to understand why this is case, it may have been hard for some companies to know what to report. The concept of a separate report after implementing each module seemed initially to lighten the load of after-the-fact reporting when memories are fading and to enable the companies to pinpoint details that might help them implement the next module. A draft report was sent to companies with request for comment and a number of useful and interesting comments were received, such as one company who commented: *“Although we dropped out of the initial project we have taken inspiration from the standard and made many improvements”*. Another company commented *“I am sure other companies in the programme have also gotten benefits even if they have not reached the official ISO milestone. You should not underplay this improvement and the awareness you are building”*. In reference to support required, one company made the following points: *“I am not sure what our status is from your perspective at this time but we have been implementing a number of recommendations as they become appropriate... We are certainly interested in continuing with the project and we would welcome a site visit. As an experienced ISO implementer I think such a visit is essential to ensure that we are on the correct track”*.

5 Conclusions

Despite the lack of apparent success in terms of bringing all companies successfully through this programme, the researchers are optimistic about this future for this new standard and offer some commentary on the experience to date. At least some personal mentoring and assessing at the company site are desirable and sometimes necessary for implementation of this type of programme. To address this, we have arranged site visits with the companies still going and will include this in the future. In addition, from a VSE perspective the lack of time is probably more of an issue than lack of financial help for small companies. Essentially very small companies have too much work to do, with too little time and people to do it. This was supported by one company, who commented “*We don’t even know if we will be in business next month.... This might be a bit too much*”. In some cases, a standard is still viewed as an add-on task, not a way to do business. In some cases, it is seen as nearly essential for the business. These findings support prior studies [6, 7, 8] in VSEs in relation to adoption of lifecycle standards and indicate there is much work yet to be done.

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