Defining an Iterative ISO/IEC 29110 Deployment Package for Game Developers

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ABSTRACT

Software development in a small development team is a challenge, as people have to fulfill several roles, which in larger groups would have dedicated people. To help in this aspect, the ISO/IEC 29110 Lifecycle profiles for Very Small Entities has been developed to help organization and manage the workflow. However, the model presented in the ISO/IEC 29110 is rather abstract, and prominently follows the waterfall approach, even though the documents do amend agile practices as one acceptable approach. In game development this loosely defined approach is problematic, since games industry heavily relies in the agile practices with short cycles of iterations. In this article, the authors present their study of game development organizations, and describe the ISO/IEC 29110 deployment package “Highly Iterative Software Processes” which combines the Entry level model with the industry-specific requirements. In general, the definition of support for the iterative development makes the model feasible for the industry.

KEYWORDS

1. INTRODUCTION

The standardization work and standardized systems are important for many business areas, and the video game industry is not an exception even though the aspect of standardization affect more the hardware than the software side of the business (Gallagher and Park, 2002). The games industry has traditionally had very strong de facto standards in the form of different home entertainment systems (Peltoniemi 2008). During the last few decades the game industry has also grown significantly, from 7 billion USD in 1999 to approximately 80-90 billion in the year 2013 (for example Gartner, 2013). The games industry is therefore a significant sector of the software industry, with the size of 400 billion USD worldwide, although the number only accounts for companies, which produce and sell software as their main business (Gartner, 2014). Because of the growth, the games industry has more companies and employs more people than before, with a healthy amount of startup businesses in the form of indie and mobile game developers.

From the technical point of view, game development is not very far from any other software development endeavor (for example Koutonen and Leppänen, 2013). Game development includes more artistic aspects such as graphics, level designs and sound effects, but the fundamentals of software development such as software design, programming and quality assurance are more or less similar (Blow 2004, Petrillo et al., 2008). Game studios are famous for their relaxed approach in software process management, but some studies imply that the industry in general would benefit from the adoption of software engineering
principles and practices (Kultima and Alha 2010, Petrillo et al., 2008). In this sense, the ISO/IEC 29110 Lifecycle profiles for Very Small Entities (VSEs) standard could be ideal for the game industry. The model is aimed towards small enterprises and projects with less than 25 people involved, is lightweight as a standard and offers a relatively simple and straightforward model to follow. These attributes make the model a suitable candidate for developing a systematic and efficient approach for the process, while still allowing flexibility in development.

This paper studies the game industry from the viewpoint of software engineering, and discusses the development of the “Highly Iterative Software Process” deployment package for the ISO/IEC 29110 standard. In the beginning of the study we set the research questions “How applicable is the ISO/IEC 29110 for game developing organizations?” and “How should the ISO/IEC 29110 model be revised to enable support for game developing organizations?”. This work also continues our earlier studies of game developing organizations and builds on our earlier studies on ISO/IEC 29110 applicability (Kasurinen et al., 2013a), game design principles (Vanhala et al., 2013) and organizational infrastructures (Kasurinen et al., 2013b). Here we also propose a deployment package for the ISO/IEC 29110 Entry level process models that enables direct applicability to game development.

The rest of the paper is constructed as follows; Section 2 provides an overview of the related research in game development from the viewpoint of software engineering and introduces the ISO/IEC 29110 entry level model, Section 3 presents the results from our research, while Section 4 introduces the principles of the ISO/IEC deployment package. Section 5 discusses the overall implications and finally, Section 6 closes the paper with conclusions.

2. RELATED RESEARCH

Game development is not very different from other software development. The rising revenues of the game industry during the last fifteen years has been followed also by studies of computer games from the viewpoint of software development. For example, Peltoniemi (2008) has studied game lifecycle models from the viewpoint of creativity and artistic features. He compared games to other related domains such as software or movie industry. The main findings indicate that although the game industry is not very mature process-wise, it has very stable and predictable hardware platforms and a constant drive to create new creative products to overcome competition. Peltoniemi argues that because of highly iterative work style and continuously changing requirements the established lifecycle models from software engineering are not suitable in in the games industry. Kultima & Alha (2010) observed that not all game organizations apply the “creative chaos” as their operating model; in their study the most common type of people in the industry were called instrumentalists, as they are focused on the infrastructure, tools and systematic technical design. Interestingly, the third most common group called nihilists was also against “creativity for the sake of creativity,” as they felt that innovation and creativity was not actually needed in their work. Some interviewees even said that the creativity has been reduced to a marketing and publicity act, since the real business-savvy companies do not like to take risks and customers in general tend to be very conservative in their purchase behavior.

There are also studies that directly observe and identify the problems of the game development processes. Petrillo et al., (2008) observed the process problems of game developers. Their study identified unrealistic scope, feature creep, feature cutting, design problems, delays and technical problems to be the most common development challenges, which affected more than half of their observed projects. In addition, budget overruns, lack of documentation, test problems and lack of communication were also identified. Similar problems and challenges were also identified by Kanode and Haddad (2009) and earlier by Blow (2004). All these studies agree that game industry should adopt principles and practices from the software engineering discipline to remedy their most pressing issues.

From the perspective of information system integration and software engineering, the small-scale organizations such as game studios can experience difficulties when adopting the process
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