Chapter 94
Disciplined or Agile?
Two Approaches for Handling Requirement Change Management

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ABSTRACT

Software requirements changes become necessary due to changes in customer requirements and changes in business rules and operating environments; hence, requirements development, which includes requirements changes, is a part of a software process. Previous studies have shown that failing to manage software requirements changes well is a main contributor to project failure. Given the importance of the subject, there is a plethora of efforts in academia and industry that discuss the management of requirements change in various directions, ways, and means. This chapter provided information about the current state-of-the-art approaches (i.e., Disciplined or Agile) for RCM and the research gaps in existing work. Benefits, risks, and difficulties associated with RCM are also made available to software practitioners who will be in a position of making better decisions on activities related to RCM. Better decisions can lead to better planning, which will increase the chance of project success.

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INTRODUCTION

The acceptance of changes is low in disciplined software development due to detailed planning, extensive design, and documentation (Awad, 2005). In contrast, as stated in the Agile Manifesto, agile software development continually ”welcomes changing requirements, even late in development” due to its characteristic of incrementally elaborating the product as a means to assure customer satisfaction (Stålhane et al., 2014)(Cao & Ramesh, 2008). Therefore, it promotes constant feedback and communication between stakeholders.

In agile software development, changes in requirement are frequent, occurring due to several causes such as organizational, market demand, customer need, or increase in the knowledge of the software engineers. As a result, it can be a challenge to identify, analyze and evaluate the consequences and impacts of these changes (Eberlein & Leite, 2002). Therefore, Requirements Change Management (RCM) is a challenging task, and neglecting it might lead a project failure (Cohn, 2004).

More recently, there is an increasing number of reported studies on research topics such as identifying change causes (Bano et al., 2012), change taxonomies (Saher et al., 2017)(McGee & Greer, 2012) and requirements change process models (Bano et al., 2012). From a researcher's perspective, the diversity of requirements change management makes it hard to develop general theories. Empirical research in RCM thereby becomes a crucial and challenging task (Wagner et al., 2019). Empirical studies of all kinds, ranging from classical action research through observational studies to broad exploratory surveys, are necessary to understand the practical needs and improvement goals in RCM to guide problem-driven research and to empirically validate new research proposals (Wagner et al., 2019).

To the extent of our knowledge, there is no precise definition of an RCM in agile context or even a catalog of agile practices to support the various steps that comprise the ARCM process. In order to address this research gap, the present chapter book focuses on (i) defining a process to agile requirement change management and (ii) identifying the agile practices used to support the steps that comprise the ARCM process.

The authors conducted an exploratory study where 21 research papers have been analyzed. As result, we identified and classified 11 distinct agile practices that provide support for RCM in the context of agile development. For doing so, the present chapter book study followed the guidelines described by (Kitchenham & Charters, 2007)(Petersen et al.., 2015). For the sake of simplicity, to identify the primary studies, we performed a hybrid search strategy procedure (Mourão et al., 2017). Although agile practices seem to have a very efficient way of managing change, we were able to identify practical challenges in some of the practices described in this study. This study provided information related to many aspects of ARCM, giving a holistic view to handle this process. Additionally, we described the key features, as well as some research gaps in existing work for ARCM. Benefits, risks, and difficulties associated with ARCM are also made available to software researchers and practitioners making better decisions on processes and practices to support ARCM.

The remainder of this chapter is structured as follows. Section 2 presents the main related studies. Section 3 presents the main causes of requirement changes pointed out in the literature. Section 4 describes in details the disciplined requirement change management. Section 5 point out the definition of agile requirement change whereas Section 6 describes the proposed agile requirement change management process. Section 7 outlines the main research gaps in RCM. Finally, Section 8 presents the final remarks and future work.