Chapter 36
Adapting a Requirements Engineering Process by Key Factors Estimation

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ABSTRACT

Literature mainly focuses the adaptation of any requirements engineering process on the possible variations of elicitation techniques, mainly due to information sources characteristics. However, these particularities, usually called situational factors, are seldom considered in other activities of the requirements process. Most situational factors, when considered in software projects, have a high influence on the requirements process. Therefore, the different situations that may attempt against or may favor a successful requirements process should be identified at the beginning of the project. Additionally, some of such factors may evolve along software development life cycle; this should motivate a reengineering of the requirements process at some strategic milestones. In this chapter, a process for constructing and dynamically adapting a requirements process is proposed, focusing on the evolving factors. The process follows rules based on different combinations of situational factors at specific control points and manages a repository of process blocks to perform the tailoring.

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INTRODUCTION

The monolithic application of any process, disregarding the context conditions, may lead to unnecessary lack of effectiveness. By the contrary, the adaptation of any process to a particular situation is considered a good practice in many fields. Literature shows that this practice is quite common in Software Engineering processes, such as the methodologies Rational Method Composer (Haumer, 2005) and OPEN Process Framework (Firesmith &Henderson-Sellers, 2002). However, Requirements Engineering (RE) approaches are seldom tailored to context or project situations (Potts, 1995; Leite, Hadad, Doorn, & Kaplan, 2000; Leffingwell & Widrig, 2003; Seyff et al., 2009). Nevertheless, sometimes the elicitation activity, as part of an RE process, is performed taking into account some environmental characteristics, usually called situational factors, such as number of information sources, users geographical distribution, users time availability, users experience, among others (Maiden & Rugg, 1996; Hickey & Davis, 2003; Coulin, 2007; Carrizo, Dieste, & Juristo, 2008). Recently, some proposals have appeared to design an RE process for a specific project by selecting existent RE techniques (Lauesen, 2002; Lobo & Arthur, 2005; Alexander & Beus-Dukic, 2009).

There are activities of most of the requirements processes that are invariant regardless of situational factors, while others should be modified, removed or replaced. Not only activities may be adapted, models created in the process may be also suited for the situation (Galster, Weyns, Tofan, Michalik & Avgeriou, 2014). This means that these processes may be assembled like a flexible puzzle using interchangeable pieces depending on the situational factors identified.

Situational Method Engineering (SME) is advocated to build methods tailored to specific situations for the development of systems (Kumar & Welke, 1992). Following its principles, the adaptation of any software development process is based on indicators describing the situation (Khan, bin Mahrin & bt Chuprat, 2014). Part of the task is to compose such indicators based on observable factors, like degree of business processes reengineering, context complexity, developer expertise in the application domain, and project size, among others. Ideally, these situational factors should be considered before beginning the software process. However, there are factors not accurately known when initiating a software project, while other factors may change during the project. Hence, a dynamic view of the adaptation of a software development process achieves a better performance of the process itself. Considering that defining requirements is the starting point of a software development, it should be necessary to pay more attention to factors influencing the RE process.

A frequent question of practitioners is related with the need of performing all the process steps to develop the software requirements. *Is it possible to shorten the road or to follow a different one?* Under some circumstances, there is an opportunity to reduce the RE process by deleting or simplifying activities; and sometimes different paths may be followed by choosing other techniques or even extending some activities. Project managers should make decisions depending mainly on the reality he or she is facing.

Therefore, the rational and some practice on the tailoring of an RE process according to a particular set of situational factors is presented in this chapter. Recommendations about the estimation of these factors are exposed as an enhanced solution. Additionally, some lessons learned, and future works are reported.