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ITB10290

Chapter V

An Approach for Evolution-Driven Method Engineering

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ABSTRACT

This chapter considers the evolutionary perspective of method engineering. It presents an approach for method engineering supporting evolution of an existing method, model, or meta-model into a new one satisfying a different engineering objective. The authors hope that this approach could be helpful for a project-specific method construction. This approach proposes several different strategies to evolve from the initial paradigm model to a new one and provides guidelines supporting these strategies. The approach has been evaluated in the Franco-Japanese research project around the Lyee methodology. A new model called Lyee User Requirements Model has been obtained as an abstraction of the Lyee Software Requirements Model. The chapter illustrates this evolution case.

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INTRODUCTION

To manage the increasing complexity of information systems (IS), IS engineers ask for new methods, taking into account the specific situation of each IS development project. This problem is considered by the situational method engineering (SME) discipline. Instead of looking for universally applicable methods that was the idea of traditional method engineering (ME), SME proposes to develop project-specific methods or to adapt existing ones to specific project situations (Kumar & Welke, 1992). Therefore, each IS development project starts with the definition of its proper method that best fits its situation. It is clear that traditional method construction techniques are too expensive and time-consuming, and are not appropriate to tackle the project-specific method construction. As a consequence, the aim of SME is to provide fast and simple method construction and adaptation techniques and tools. In the next section we survey the research achievements in this domain.

In this work we consider method engineering from the evolutionary point of view. In other words, we look for an approach supporting evolution of an existing method, model, or meta-model in order to obtain a new one better adapted for a given engineering situation and/or satisfying different engineering objective. We consider such a method evolution as situation driven and relate our work to the area of SME.

The approach that we propose in this chapter is based on some initial model or meta-model that we call the 'paradigm model' and supports the evolution of this paradigm model into a brand-new model satisfying another engineering objective. That is why we call this approach "evolution-driven method engineering." We embedded in this approach our method engineering experience and especially that gained in the meta-modeling domain. The hypothesis of this approach is that a new method is obtained either by abstracting from an existing model or by instantiating a meta-model.

We have evaluated our approach in the Franco-Japanese collaborative research project Lyee dealing with the Lyee methodology improvement. Lyee, which stands for GovernmentaL MethodologY for SoftwarE ProvidencE, is a methodology for software development used for the implementation of business software applications. Lyee was invented by Negoro (2001a, 2001b). The aim of this project was to develop a methodology supporting software development in two steps: requirements engineering and code generation. The latter was already supported by the LyeeALL CASE tool proposed by Negoro (2001a, 2001b) in order to generate programs, provided a set of well-formatted software requirements are given. The *Lyee Software Requirements Model* (LSRM) expresses these requirements in rather low-level terms such as screen layouts and database accesses. Moreover they are influenced by the LyeeALL internals such as the Lyee identification policy of program variables, the generated program structure, and the Lyee program execution control mechanism. Expe-

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