

# Acquisition of a Project-Specific Process

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**Abstract.** Currently, proposed development processes are often considered too generic for operational use. This often leads to a misunderstanding of the project-specific processes and its refuse. One reason for non-appropriate project-specific processes is insufficient support for the tailoring of generic processes to project characteristics and context constraints. To tackle this problem, we propose a method for the acquisition of a project-specific process. This method uses a domain-specific process line for top-down process tailoring and supports bottom-up refinement of the defined generic process based on tracking process activities. The expected advantage of the method is tailoring efficiency gained by usage of a process line and higher process adherence gained by bottom-up adaptation of the process. The work described was conducted in the automotive domain. This article presents an overview of the so-called Emergent Process Acquisition method (EPAc) and sketches an initial validation study.

## 1 Introduction

Nowadays, automotive products are becoming more and more complex. In order to ensure the quality of safety critical products like vehicles, effective and efficient development processes are needed. As projects have different contexts and goals, tailoring methods are needed that allow adapting the generic processes to the project-specific needs. The tailoring approaches used in practice (e.g., the tailoring approach proposed by the V model [10]) usually involve checking conditions and removing objects of the base model. The V model distinguishes between tailoring at the start of a project and tailoring in the course of the project at defined points in time. One difficulty of such tailoring is the identification of the regression process modification to be performed. For example, a change of four product artifacts can result in further changes of 26 process models [12]. Further, more process tailoring often requires not only the removal of process objects, but also their replacement, or the addition of new objects. The V model tailoring method does not define how to deal with such kinds of process modifications.

To tackle the problem, different tailoring approaches are proposed in the literature. These tailoring approaches can be classified into two types [12]: component-based approaches and generator approaches. The component-based approaches try to build a

project-specific process based on the process parts. The generator approaches try to build a project-specific process by instantiating a typical process architecture. The advantage of component-based approaches is the ability to support reuse of process fragments (e.g., processes gained by descriptive process modeling). The main deficiency of component-based approaches is the lack of support for process adaptation and for guaranteeing consistency. The advantage of generic approaches is their ability to assure consistency and to reuse process fragments. The disadvantage of the generic approaches is the lack of support for process fragment reuse.

Our proposed solution to the problem is the Emergent Process Acquisition (EPAc) method. This method uses a domain-specific process line for top-down tailoring and refines the tailored process based on the process activities performed in a first process iteration. In this way, the initial variant of the emergent process is built. An *emergent process* is a process that needs to cope with changing goals and context characteristics, which can only be anticipated to a very limited extend before the start of the project. Therefore, the process itself needs to be highly adaptable, and support for the adaptation is necessary.

Typical reasons for the need for emergent processes are:

- Changing requirements. The requirements are not completely known at the start of the project and, in addition, the effects of new or modified requirements on the development process cannot be anticipated. Thus, the activities to be performed can only be detected in the course of the project, too.
- Changes in the project environment. One example for a business environment change is the establishment of a new business relationship (e.g., a new international collaboration). One example for a change in the development environment is a replacement of a validation technique (e.g., a project team follows a prescriptive process and recognizes that the process is not really efficient to perform module testing).

The expected advantage of our method is higher process acceptance by project teams, as the process is based on experience from past projects and feedback from actual project performance.

The paper is structured as follows: The second section describes the background information. The third section describes the EPAc method. The fourth section briefly sketches our experience gained with the usage of the EPAc method. The fifth section discusses related work and strengths of our EPAc method. Finally, Section 6 gives a short summary and an outlook on future work.

## 2 Background Information

A systematical state-of-the-practice analysis performed by DaimlerChrysler [6] resulted in the awareness that the software development processes are too generic for operational use. The applied tailoring approach [6] does not provide enough support to project teams. This has two reasons: First, it is difficult for process engineers (who are usually also playing a role in a development team) to identify the regression process modification if the process changes. Second process tailoring often requires not