Model-supported Process Adoption and Assessment in the Context of Multiple Practice Repositories

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Summary

Although software products exist for more than 60 years, their successful development within a software project is still a challenge. A reason for this high failure rate might be poor software processes and the lack of systematic software process improvement. Considerable attention has been given to software process improvement in the last years and thus, practice repositories, such as CMMI-DEV, SPICE, COBIT, ITIL, have been defined. These are collections of best practices that describe activities which have proven themselves as guidelines for the improvement of software processes in organizations.

Organizations use the practice repositories by adopting them or by performing assessments based on them. Moreover, many organizations aim to use multiple practice repositories to benefit from synergy effects and to achieve a higher effectiveness in the software process improvement. However, there are several challenges when using multiple practice repositories. These repositories have to be addressed in a coordinated and systematic way to benefit from them correspondingly.

MOSAIC, a model based approach, is proposed to support the usage of multiple practice repositories and achieve an effective and efficient adoption and assessment based on an integration of these repositories with the software project context. This integration allows various analysis activities to be automatically performed on the integrated models. For this purpose, the structure and terminology of the various practice repositories is normalized, as well as the software project context is modelled by defining situational factors that describe it.

An integration on a common structure and terminology is possible at a conceptual level. The concepts and their similarity relations are extracted from the practice repositories and saved in a central model. This central model relates the various repositories with each other and the repositories with the situational factors and thus, with the software project context. This approach is flexible and allows the integration of practice repositories from different software areas. Therefore, based on the purposes and needs of organizations, the integration can be extended over time into a broader process consideration. Furthermore, specific situational factors that do not describe only the software project settings but also other working contexts can also be added to satisfy specific needs of organizations.

This integration allows various analysis activities on the created models. Consequently, best suited practices from multiple practice repositories can be automatically selected, similar practices and the dependencies between them can be automatically identified. All these analysis activities are based on various metrics that measure the support degree of the practices for the software project context, their similarity and dependency degree respectively.

All these analysis automations can be utilized by organizations when attempting to make key process decisions in their software process improvement. Various applications of MOSAIC for organizations that work with multiple practice repositories are listed and described in this work. Hence, a guidance for software process improvement initiatives of organizations is provided to allow an effective and efficient adoption of such repositories and assessments according to these repositories.

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