

Enterprise-Oriented Software Development Environments to Support Software Products and Processes Quality Improvement

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Abstract. Software organizations have to adapt efficiently to cope with clients needs changes and new and evolving technologies in order to guarantee business success. Moreover, organizations must continuously enhance their capability to develop software in order to increase products and processes quality. These characteristics constitute dynamic environments that require specific competences from software engineers such as knowledge related to software technologies, ability to adapt software processes concerning project characteristics, and experience on product and process quality management. This paper presents enterprise-oriented software development environments that support software engineers to execute software processes more effectively and to produce products with better quality. A main feature of these environments is the support offered to organizational knowledge management. Thus the paper also presents the main characteristics of the knowledge management infrastructure integrated to those environments. The practical experience using the environments has shown several benefits, such as an increase of product and process quality, and the preservation of organizational knowledge related to software processes and the development of software products.

1 Introduction

Software organizations have to adapt efficiently to cope with clients needs changes and new and evolving technologies in order to guarantee business success. Moreover, organizations must continuously enhance their capability to develop software in order to improve their innovation ability and increase organizational processes efficiency [1]. In order to achieve this goal, organizations must be more productive, increase the quality of software products, diminish project effort and costs, and deal with the criticality of time-to-market for commercial products [2].

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ability to adapt software processes concerning project characteristics, and experience on product and process quality management. Globalization, increasing competition, more dynamic markets and shorter cycles in product development and innovation increase the need for a better adaptation to those environmental factors. These factors establish the need for a consequent adaptation of all business processes, including software processes, to existing and future market needs [1].

Software processes are knowledge-intensive business processes, i.e., a process that relies very much on knowledge [4]. Therefore, software processes can be considered as core processes of the organization, which executions should produce or add new knowledge to the organization's knowledge repository. Moreover, software processes executions require from software engineers innovative and creative abilities [3, 4].

Since participants of software processes executions have different background knowledge and past-experiences, different domains knowledge are applied at different levels [1]. Besides that, knowledge and software processes are integrated and should be evaluated as a whole, i.e., for knowledge management to be of use in an organization, it should be effortlessly incorporated in everyday business activities. Large parts of an organization's activities, especially on the operational level, are structured around business processes [1]. Therefore, it is imperative to integrate knowledge management with software processes, which means that a computerized system that supports business processes should also support knowledge management [5, 13].

In this context, Software Development Environments (SDE) have been playing an important role to support software engineers in the execution of software processes through the application of specific procedures that combine integrated tools and techniques in accordance to particular software paradigms. Moreover, SDE are evolving to integrate knowledge management activities within software processes aiming to support developers to produce better software products based on organizational knowledge and previous experiences more effectively [6].

This paper presents **Taba Workstation** SDEs. The **Taba Workstation** was created from the perception that different domain applications have distinct characteristics that influence in the environment from which software engineers develop software [7]. It is being used to support the deployment of software processes in small and medium size Brazilian companies as part of a larger project, named **QualiSoft**. The objective of this project is to increase the capability of software organizations and the quality of their software products through the adequate use of software engineering techniques in their software processes.

The next section presents some basic concepts related to SDE. The **Taba Workstation** infrastructure is presented in section 3. The steps executed to support software processes deployment in small and medium size companies in the context of the **QualiSoft** project are presented in section 4. The section 5 presents the **Taba Workstation** Knowledge Management tools. The section 6 presents some practical results of organizations that have been using the **Taba Workstation** SDEs. Finally, section 7 presents some conclusions and points out future work.