Chapter 36

Enhancing DotProject to Support Risk Management Aligned with PMBOK in the Context of SMEs

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ABSTRACT

Many problems in software development projects are due to risks and could be avoided or minimized if identified and treated pro-actively. In this context, software tools to support risk management could be very helpful. However, it is difficult to find a project management tool, accessible to Small and Medium Enterprises (SMEs) that provides adequate support to risk management in conformance with best practices such as the PMBOK. Therefore, this paper has the objective to review support provided by popular project management tools with respect to risk management and to present enhancements made to the open-source tool – dotProject – in order to systematically support risk management aligned with the PMBOK. An initial evaluation identified benefits in the implementation of risk management processes in software SMEs, and, thus, contributing to their projects' success.

INTRODUCTION

Many problems in software projects are caused through risks and could be avoided or minimized, if they are identified and treated in advance (Cristina & Salmeron, 2012). Initiating a project without proactively focusing on risks not only increases the probability of risks occurring, but also the impact they may have on the project, and, thus, the chances of project failure (Persson, Mathiassen, Boeg, Madsen, & Steinson, 2009; Öbrand, Nils-Petter, & Holmstr, 2012). A risk is an uncertainty,

whose materialization can negatively impact on the project plan (Jalil & Hanif, 2009). For example, if hardware prices increase, the project may come in over budget or if a key software analyst becomes ill, critical activities may be delayed. The probability of a risk is the chance it happens, whereas the risk impact indicates what will be affected in the project (e.g., schedule, budget, or quality) and to what degree. Risk management serves to identify the risks to which the project is exposed to, and to plan actions to minimize the impact or even avoid them happening (PMI, 2013). It consists of a set of processes, responsible for identifying the project risks, analysing them, planning risk responses, and to control risks throughout the project execution (PMI, 2013).

Yet, risk management is still underutilized in the software sector (PMI, 2010), where the majority of enterprises approaches risk management informally. This issue is even more severe as typically most software organizations are Small and Medium Enterprises (SMEs) with limited resources (SEBRAE, 2013; SOFTEX, 2012).

And, although, there exist various guides on risk management (such as the PMBOK (PMI, 2013)), comprehensive tool support for the adoption of risk management is basically only available through commercial tools such as MS-Project (microsoft.com/project) or Primavera (oracle.com/primavera). Yet, due to their price, such tools may be not suitable to the budget of many SMEs (Fabac, Radoševi, & Pihir, 2010). On the other hand, open-source project management tools such as dotProject (dotproject.net), project.net (project.net), or phpCollab (phpcollab.com) also provide some kind of risk management, yet, are less complete and generally not in conformity with best practice guides such as the PMBOK (Pereira, Gonçalves, & Wangenheim, 2013). However, due to their low cost and flexibility, they may represent an interesting alternative especially for SMEs.

One of the most popular and comprehensive open-source tools is dotProject, a web-based tool for project management. However, dotProject is also far from supporting completely the project management process as proposed by the PMBOK (Dippelreiter, Grün, & Pöttler, 2010; Wangenheim, Wangenheim, & Hauck, 2009). Especially for risk management, dotProject itself does not provide any support (Pereira et al., 2013). And, although, there exist an add-on module that provides basic support to risk management for risk registering and reporting (SOURCEFORGE, 2013), it is still far from providing comprehensive support.

In this context, this paper summarizes the state of the art of the support provided by open-source tools for risk management and provides a proposal of how to support the risk management process by enhancing dotProject's functionalities in conformance with the PMBOK customized to the context of SMEs.

BACKGROUND

This section briefly introduces the main concepts used in this paper, such as project management and risk management.

Project Management

Project management is the use of knowledge, abilities, tools, and techniques in order to make project activities meet their requirements (PMI, 2013). A project is defined as a temporary effort undertaken to create a single result. The project management life cycle is composed of 5 processes groups (Figure 1):

1. Initiation: To start a new project or phase and to obtain authorization for its execution;
2. Planning: To establish project goals and scope and to define the actions for the project to meet its goals;
3. Execution: To conduct the necessary work to carry out the activities in the project plan;

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