Multiple Risk Management Process Supported by Ontology

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Abstract. Multiple Projects Development Environments have evolved recently. However, most available environments do not provide risk management process support to the project manager's activities. This support could be provided through the analysis of the interactions between projects. One of the main weaknesses of the approaches up to now is that risk management process improvement based on the risks between ongoing projects and completed ones is being neglected. In this light, we propose the creation of a Risk Management Model for Multiple Project Environments to treat the risk interactions between projects.

1 Introduction

Software development projects, given their diverse and abstract nature, offer unique challenges and risks [Boehm and DeMarco 1997]. According to the Standish Group Report, "CHAOS: A Recipe for Success", only 28 percent of all software projects in 2000 were on time and within budget and had all planned features [Murthi 2002] – which means that the other 76 percent of projects failed or did not meet specified goals.

The increasing competition on the market and the challenging expectations of the clients´ requirements force the software developing organizations to closely manage their risks [Gusmão and Moura 2004]. Several risk management approaches [Charette 1990, Humphrey 1990, Boehm 1991, Higuera 1994, Chapman and Ward 1997, Kontio 1998, Jacobson 1999, Barros 2001] have been introduced during the past two decades. While some organizations defined their own risk management approaches, others do not manage their risks explicitly and systematically [Gusmão and Moura 2004]. Risk management based on intuition and individual efforts alone is rarely effective and consistent. Risk management is necessary during both project management and software development operations.

Whereas most research has focused on managing technical and project risks in software development projects, there are many other components of software development projects or multiple projects environments that are currently not being evaluated and managed effectively [Gusmão and Moura 2004]. Risk is always involved

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with loss, but also considers the possibility that the outcome of certain risks might be a gain.

In Multiple Projects Environments, the project manager has a particular challenge of balancing several projects with a seemingly limitless workload and limited resources, and doing it in a dramatically altered business environment [Dye and Pennypacker 2000]. This kind of difficulty is made worse by the fact that, the organizations managers need to make decisions that probably affect some projects with different lifetimes and resources. Every project decision involves risk because there is always uncertainty information [Moura et al. 2004].

Risk management is the heart of project management, and software product development inevitably requires project management. Risk management must be promoted via dynamic environments that support life cycle project processes based an organization issues. However, most organizations do not provide support to risk management processes, tools for communications, and neither to the project manager´s activities. In this light, this tutorial presents OntoPRIME – risk domain ontology – which supports multiple project environments helping managers to get project risk information in all phases of the software development process.

2 Overall and Detailed Objectives

Unfortunately, some project managers rely on a reactive risk management strategy, that is, merely reacting to risks as they occur. This is even worse in multiple projects environments. A more intelligent strategy is preventive risk management, which is a way to improve the organization´s knowledge about its projects.

Using software multiple projects environments concepts, this tutorial aims to present on Ontology for Project Risk Management to support a multiple project risk management process. Theoretically, the process is based on CMMI – Capability Maturity Model Integrated [SEI 2001], Software Engineering Institute Risk Model [Higuera 1994], Quantitative and Qualitative techniques in risk evaluation [Humphrey 1990], as a way to improve the risk management process in organizations. Using software multiple projects environments and ontologies concepts [Corcho et al. 2001] and based on Taxonomy -based Risk Identification [Carr et al. 1993], we developed the risk domain ontology – *Onto*PRIME.

*Onto*PRIME is an Artificial Intelligence component that helps software teams to evolve their project risk management. It is a part of the Multiple Project Risk Management Model, an artifact development in a doctorate study.

The methodological development is conducted in an action research manner within a real-life systems development project. *Onto*PRIME was modeled in a multidimensional structure to enrich and qualify the processes and stored knowledge.

Although many risk management approaches provide a process to support development software, what is really needed is a common vocabulary to improve and support all information resulting from this process in order to comfortably refer to it and add new contributions. The main idea is to facilitate risk analysis interaction between projects and communication as a way to provide access to the organization´s multitude of project information. Besides, it is a way to develop an organizational knowledge management [Falbo 2004].