

7th International Conference on Product Focused Software Process Improvement

~Profes 2006~

Multiple Risk Management Process supported by Ontology

Tutorial Proposal

Cristine Martins Gomes de Gusmão^{1,2}, Hermano Perrelli de Moura¹

¹Centro de Informática – Universidade Federal de Pernambuco (UFPE)
Caixa Postal 7851 – 50.732-970 – Recife – PE – Brazil.

²Curso de Bacharelado em Sistemas de Informação – Faculdade Integrada do Recife
(FIR)

Recife – PE – Brazil.

{cmgg,hermano}@cin.ufpe.br

WWW home page: <http://www.cin.ufpe.br/~hermano/gp2>

***Abstract.** Multiple Projects Development Environments have been evolvement nowadays. 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 weakness of the approaches up to now is to neglect the risk management process improvement based on the risks between on going projects and those ones that were ended. 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 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 others 76 percent projects failed or did not meet specified goals.

The increasing competition in the market and the challenging expectations of the client's requirements force the software developing organizations managing closely 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 and 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.

However 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 evaluated and managed effectively [Gusmão and Moura 2004]. Risk is always involved 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 particularly challenges as 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 difficult enhanced, as the organizations managers need to take decisions that probably affect one or other project that has different lifetime 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 on organizations issues. However most organizations do not provide support to risk management processes, tools for communications, and either to the project manager activities. In this light, this tutorial presents *OntoPRIME* – risk domain ontology – that supports multiple project environments helping managers getting projects risk information in all phases of software development process.

2. Overall and detailed objectives

Unfortunately, several project managers rely on a reactive risk management strategy that is, merely reacting to risks as they occur and this is even worse in multiple projects environments. A more intelligent strategy is preventive risk management and it is a way to improve the organization knowledge about their projects.

Using software multiple projects environments concepts this tutorial aims to present 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 the 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 risk domain ontology – *OntoPRIME*.

OntoPRIME is an Artificial Intelligence component that helps software team to evolve the project risk management. It is a part of 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. *OntoPRIME* was modeled in a multidimensional structure to enrich, 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 result of this process in order to comfortably refer to it and add new contributions. The main idea is facilitate risk analysis interaction between projects and communication as a way to provide access to the organizations multiple projects information's. Besides it is a way to development an organizational knowledge management [Falbo 2004].

2.1. Tutorial learning objectives

When completed, the attendee will be able to:

1. Understand the different kinds of risk within organizations.

2. Understand the importance of ontology that includes the standardization and hierarchical arrangement of concepts.
3. Understand the importance and advantages of managing multiple project risks supported by ontologies as a way to increase knowledge and improve the risk management process.

2.2. Tutorial format

Time requirement: half day

This tutorial is focused on theory, practice and a prototype presentation.

- a) Theory – a review of risk management process approaches available in software engineering literature (one hour).
- b) Practice – a sample of techniques and methods to risk identification (one hour).
- c) Prototype Presentation – a sample of case study using an ontology prototype (one hour).

2.3. Tutorial target audience and level

This tutorial has an interesting subject for graduating and pos-graduating students and mid-level managers.

- a) Audience Level: Intermediate
- b) Background knowledge expected: software engineering and project management.

3. Qualifications of the Instructors

Hermano Perrelli de Moura - Project Management Professional (PMP). PhD in Computing Science, University of Glasgow, Scotland. MSc in Computing Science, Federal University of Pernambuco, Brazil. Electronic Engineering, Pernambuco Federal University, Brazil. Professor of Project management at Pernambuco Federal University, he has been taught many courses on the subject and doing consulting on project management for software development projects. Co-founder of Qualiti Software Processes, a company specialized in software process improvement.

Cristine Martins Gomes de Gusmão – PhD student in Computing Science Program, Risk Management research area, Federal University of Pernambuco. MSc in Computing Science, Federal University of Pernambuco, Brazil. Professor of Project Management and Software Engineering at Faculdade Integrada do Recife, she has been taught many courses and presentations about project risk management and developing projects to support risk management process based on intelligent components.

References

- Boehm, B and De Marco, T. Software Risk Management. IEEE – Software. IEEE Computer Society Press. 1997.
- Murthi, S. Preventive Risk Management for Software Projects. IEEE – Software. IEEE Computer Society Press. 2002.
- Gusmão, C. M. G. e Moura, H. P. Gerência de Risco em Processos de Qualidade de Software: uma Análise Comparativa. Anais do III Simpósio Brasileiro de Qualidade de Software. Brasília – DF – Brasil. 2004.
- SEI – Software Engineering Institute - CMMI - Capability Maturity Model Integration version 1.1 Pittsburgh, PA. Software Engineering Institute, Carnegie Mellon University. USA. 2001.
- Jacobson, I. The Unified Software Development Process. Addison-Wesley Longman Publishing Co., Boston, MA, USA. 1999.

- Corcho, O. et al. OntoWeb. Technical Roadmap v.1.0. Universidad Politécnica de Madrid. 2001.
- Dye, L. D and Pennypacker, J. S. Project Portfolio Management and Managing Multiple Projects: Two Sides of the Same Coin? In: The Project Management Institute Annual Seminars & Symposium. Houston, Texas, USA. 2000.
- Carr, M. J et al. Taxonomy-Based Risk Identification. Technical Report. Software Engineering Institute. Carnegie Mellon University. 1993
- Humphrey, W.S. Managing The Software Process. Addison Wesley, 1990.
- Boehm, B. Software Risk Management: principles and practices. In IEEE Software, Vol. 8. No.1, pp 32-41. 1991.
- Charette, R. Application strategies for risk analysis. MultiScience Press, New York, USA. 1990.
- Chapman, C. and Ward, S. Project Risk Management. John Wiley & Sons. Chichester, UK. 1997.
- Higuera, R. P et al. An Introduction to Team Risk Management (version 1.0). Special Report CMU/SEI-94-SR-1, In Software Engineering Institute, Pittsburgh, Pennsylvania, USA. 1994.
- Moura et al. Portfolio Management: A Critical View of Risk Factors Balancing. NORDNET - Proceedings of International PM Conference. Helsinki – Finland. 2004.
- Falbo, R.A. et al. Learning How to Manage Risk using Organization Knowledge. Proceedings of the 6th International Workshop on Learning Software Organizations - LSO'2004, pp. 7-18. Canada, 2004.
- Barros, M. O. Gerenciamento de Projetos baseado em Cenários: Uma Abordagem de Modelagem Dinâmica e Simulação. Doctorate Thesis. Federal University of Rio de Janeiro. 2001.
- Kontio, J. et al. Experiences in improving risk management processes using the concepts of the Riskit method, In Proceedings of the Sixth International Symposium on the Foundations of Software Engineering (FSE-6) pp. 163-174. 1998.