A Multi-Model Process Improvement Methodology Driven by Capability Profiles

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Abstract

This two-pages article presents an overview of PRO2PI process improvement methodology as an evolution of the current Software Process Improvement methodologies. The methodology is driven by a Process Capability Profile Model from one or more Best Practices Model for improving a knowledge worker intensive organization.

1. Introduction

Software Process Improvement (SPI), based on a Maturity Level or a Process Capability Profile, from a CMMI (Capability Maturity Model Integration) or ISO/IEC 15504-based model, is well established in the software industry as a successful mean for improving software intensive organizations [1,2]. In consequence, there are forces around the successful current SPI and its methodologies that urge for theirs revision and evolution, in order to deal with further opportunities.

This two-pages article presents an overview of a multi-model process improvement methodology as an evolution of the current SPI methodologies. It is named PRO2PI (“Process Capability Profile to Process Improvement”). Figure 1 show the basis for PRO2PI.


MDPEK balances seven group of forces [Figure 1] that urge for an evolution of the current SPI [3]. Three of them are described as follows. One of them is related with the need of appropriate methodological support for using elements from multiple models in an effective and integrated way. Another group of forces is related with generalization of software, services and system processes towards a more generic knowledge working processes. Another one is related with the methodological support for a co-evolution of a Process Capability Profile as a model of a process, under the process capability aspect, in order to take full advantage of the relationship between a model and its system of study.

MDPEK integrates Model-Driven Engineering (MDE) [4], Drucker’s Knowledge Working view [5], and Business Model and Strategy technologies with SPI. As defined by Drucker, the term knowledge working organization is a more generic term that includes, among others, software, services and system intensive organizations.

PRO2PI methodology has been conceived during many cycles of exploration, application and consolidation of already ten years research effort. The main goal of this article is to present an overview of the current version of PRO2PI Methodology with its methodological elements. A more detailed description of this current version is available elsewhere [6].
2. PRO2PI Methodology Overview

Figure 2 illustrates the twelve methodological elements and their relationships, that forms the version 3.0 of PRO2PI Methodology.

![Figure 2 – PRO2PI Methodology Elements](image)

PRO2PI-SMOD is a sustainable model for the continuous dissemination, usage and evolution of PRO2PI methodology. PRO2PI-REPO is a repository for reusable methodology components and process components that come into existence when a methodology component is instantiated.

PRO2PI-MMOD is a metamodel (in the meaning defined by Bézivin [4]) for both a Process Capability Profile and a Best Practices Process Capability models. A Process Capability Profile that drives a process improvement under PRO2PI methodology is also named as a PRO2PI. This metamodel is the conceptual kernel of PRO2PI methodology. It defines a consensual agreement on how elements of a process should be selected to produce a given PRO2PI. The correspondence between a process and a PRO2PI model is precisely defined by this metamodel. This metamodel specify Process Capability as the particular "aspect" of a process to be considered to constitute the model. The general architecture and two components of this metamodel are already defined: “Sinal Aberto” Concept Map [3] and “Geraes” Class Diagram [7].

Using this metamodel, PRO2PI-EUMOD1 is an exemplar unified process capability model with elements from selected relevant models, and PRO2PI-N1 is a notation to represent a PRO2PI.

PRO2PI-PROP is a set of properties for a PRO2PI. To be useful and effective for driving a process improvement cycle, i.e. to be a PRO2PI, a Process Capability Profile should possess, to a sufficient extend, at least the general five properties of abstraction, understandability, accuracy, predictiveness and inexpensive, and the more specific eight properties of relevant, feasible, opportunistic, systemic, representative, traceable, specific and dynamic. PRO2PI-MEAS is a set of measures to qualify a PRO2PI. PRO2PI-CYCLE is a process for process improvement cycles including functions to define, update and use a PRO2PI.

PRO2PI-WORK is a method for workshop to establish a Process Capability Profile. This method has been developed to guide the implementation of the first three phases of the PRO2PI-CYCLE. Two customized variations of this method are also defined. PRO2PI-WORK4A for a workshop with emphasis in the assessment of current practices and PRO2PI-WORK4E for a workshop with emphasis in education on process improvement.

PRO2PI-MFMOD is a Method Framework for engineering process capability models based on context and characteristics of a segment or domain.

3. Related Work and Conclusion

The closest initiative to PRO2PI research effort is the PriME project [8]. PriME presents an initial reasoning framework for harmonizing process improvement efforts when multiple improvement technologies and models are in use. PRO2PI can be considered as a specific proposal for that framework.

During many cycles of exploration, application and consolidation of already ten years, different versions of PRO2PI methodology and its elements have been used in many practical applications [3,6]. The rationality behind the twelve methodological elements and their current definition and utilization give the confidence that PRO2PI is achieving its objectives of be a useful and convincing proposal for the evolution of SPI.

References