Towards Context-Specific Software Process Selection, Tailoring, and Composition

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ABSTRACT

As an approach to develop suitable development processes for software projects, Software Process Selection, Tailoring and Composition (SP-STC) attract lots of attention from both industry and academia. However, without effective guidelines, how to do SP-STC often remains a mystery. This special panel aims to 1) initiate a discussion on the current research status of SP-STC, 2) identify main challenges of SP-STC and possible solutions, and 3) work out a research agenda for future work.

Categories and Subject Descriptors

D.2.9 [**Management**]: *Software process models (e.g., CMM, ISO, PSP)*

General Terms

Management.

Keywords

Software Process, Selection, Tailoring, Composition.

1. BACKGROUND

Over the decades, a variety of software processes were proposed; general-purpose processes, domain-specific processes, and lightweight processes – each having advantages and disadvantages. It is widely accepted that there is no "silver bullet", and that the "one size fits all" process does not exist. Software processes need to be tailored according to the respective company or project context. Therefore, much research was done in the area of flexible software processes, e.g., on (situational) method
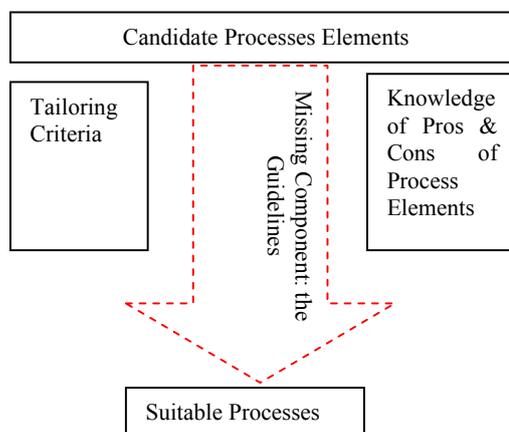
Figure 1. Common paradigm of process selection and tailoring

engineering, software process tailoring, or software process lines. Beyond the "technical parts", much research was done to investigate success factors of software projects. However, it often remains unclear how tailored software processes and success factors relate to each other. Thus, the selection of the "right" process or set of methods is left to the expertise of project managers. In response, in practice, project-specific processes are composed of several methods barely following a standardized procedure. For instance, many companies do not use a particular process mechanistically, rather they pick and choose elements that are congruent with existing work practices[1]. A survey conducted in Norway revealed that about 60% of the software companies do not follow a particular software process, but assemble tools and techniques originating from different processes[2].

Ideally, process selection and tailoring follows a common paradigm (as depicted in Figure 1.). Candidate process elements are selected, tailored and composed to form suitable processes with relevant experiences and knowledge concerning context.

Several studies try to identify critical criteria for processes selection and tailoring (Tailoring Criteria in figure 1). A systematic review conducted by Kalus et al. identified the most frequently-used tailoring criteria (e.g., team, internal environment, external environment and objectives[3]). Pros and cons of process elements refer to the knowledge of the strength and weakness. Work conducted by Esfahani et al. called on actions to establish repository of knowledge on agile method fragments (the process elements). The aim of this work is to establish evidential knowledge on what agile method fragment can accomplish, and the necessary requisites for its successful deployment[4].

However, one critical component was missing from the selection and tailoring paradigm, which we called the ***missing component-the guidelines***. Guidelines herein refer to rules or principles that may provide guidance to select, tailor and combine candidate processes with giving software project context. Without appropriate guidelines, several issues may occur:

Firstly, the resulted process may lack completeness and comprehensiveness.

Secondly, uncertainty of the processes defining results is unavoidable. While discernable logic linkage between tailoring criteria and corresponding actions (i.e., the process elements) is vague, without appropriate guidelines, results of processes selection, tailoring and combination could be varying even with same project context.

Thirdly, even with clear linkage between tailoring criteria and process elements, the process tailoring still remains challenging. There are lots of contexts should be considered, weighed and balanced during process selection and tailoring. The critical problem is, however, without proper guidelines, it could be very difficult (if not impossible) to do this for both practitioners and researchers.

Base on the discussion above, we defined the centric question of this panel as, ***how to establish proper guidelines for SP-STC?*** To answer this question, several questions need to be discussed.

1) From a pragmatic perspective, what typical concerns (context) should be considered?

2) Similarly, what kind of the knowledge we should understand before we could select specific process elements?

3) Are there any rules? principles? patterns? which should practitioners follow during process tailoring?

4) As researchers in this area, what should be done to enrich knowledge to help do better tailoring of software processes?

2. THE PANEL SESSION

In this special panel session at ICSSP2014, we invite reputed experts from both industry and academia to initiate a discussion with the specific topic – *Towards Context-specific Software Process Selection, Tailoring and Composition.* To make the panel as an opportunity for the academia to learn from the industry, we invited two panelists (Shijun Lian and Evelyn Tian) from the industry and four panelists (i.e., Barry Boehm, Marco Kuhrmann, Ita Richardson and Guoping Rong) from the academia. The session is organized as the following:

1) Short position papers presented by the invited panelists address the different perspectives of the state-of-art and state-of-practice of software process selection, tailoring and composition.

2) A discussion among the panelists and with the audience as well to map concepts with experiences and synthesize perceptions hence identifies critical challenges.

3) Based on the onsite statements and discussion, the panel will initiate a joint-statement and a proposal of the research agenda.

During the panel session, Shijun Lian shares experience on how to tailor and embed the Agile Scrum in a medical SW development process. Evelyn Tian shares experience on how to add Agile elements into a Large Scale Telecom System project. Marco Kuhrmann suggests meaningful tailoring models (process metamodels) should be built to improve software process tailoring. Barry Boehm presents the Incremental Commitment Spiral Model (ICSM) decision framework to guide both initial selection and subsequent evolution of the project's process. Ita Richardson points out the importance of domain for software process management and quality improvement. Guoping Rong proposes a multi-dimensional perspective to better understand software processes, which may help for process selection, tailoring, and composition.

3. FUTURE WORK

This special panel serves as an important step towards stimulation of research on context-specific SP-STC. Several activities to strengthen collaboration and continue working on the specific topic could be:

1) An article of the joint-statement of the panel will be published in the premier journal of software process (e.g., Journal of Software: Evolution and Process).

2) Based on the panel discussion, a research agenda will be compiled by the panelists, and posted online for public access and review in the community

4. ACKNOWLEDGMENTS

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