Software Process Simulation — At a Crossroads?

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Abstract—Software Process Simulation (SPS) has been evolving in the last decades and gained researchers’ and practitioners’ interests in software process community. However, the growth of SPS seems slow down in recent years, and the evidence for its benefits to industrial practice is not commonly reported as expected. SPS still awaits a breakthrough success. This special panel aims to initiate a discussion on the challenges faced SPS and the solutions to tackling the problems, and to work out a research agenda for future advance of SPS.

Keywords—software process; systems process; process modeling; process simulation

I. Motivations

Software Process Simulation (SPS) was initiated in software engineering with Abdel-Hamid and others’ pioneering work in 1980s [1]. Since then the SPS related research and practice have been increasing in support of planning, managing, controlling, and improving software processes in various aspects. The research in SPS arena has become one important focus of the software process community particularly since the PROSIM1 workshops from the late 1990s. The recent retrospective impact analysis of SPS [3] found a noticeable number of studies reported the success of the practical adoption of SPS in software industry.

Although the software process modelers perceived and agreed on a number of benefits to software development process can be delivered through process simulation [2], compared to other software process practices, for example the agile methods, the acceptance and adoption of SPS in software practice are still limited. It also appears that the growth of SPS research seems slow down in terms of the number of published studies in recent years (after the merge of the PROSIM workshops into the ICSP/ICSSP conferences). The question before the community is “Are we at a crossroads in software process simulation?”

The immediate motivation of this special panel session comes from the drop of the number of SPS studies in the recent years, as well as the perceptions reflected in the informal communications among the panelists and domain experts (software process modelers). The ultimate goal of this panel is to re-stimulate the research and practice on software process simulation, and also to accelerate its adoption and leverage its impact in software industry. In this panel session, we seek the answers to the questions, for example,

- Where is the future direction to advance software process simulation?
- How to replicate the success of SPS adoption in broader scope of software practice, and increase its impact in industry?
- What is an effective approach to institutionalizing the collaborations on SPS between research and practice?
- How to address the emerging techniques and changes applied to software development in modeling and simulation of software processes?

II. The Panel Session

In this special panel session at ICSSP 2012, “Software Process Simulation: At a Crossroads?”, we want to initiate a discussion about the status of SPS research and practice, as well as the gap between academia and industry. To be specific the overall goals of this special panel session are

- to identify the challenges, issues, and problems in current SPS research;
- to suggest solutions to tackle the challenges, and close (and further bridge) the gap between research and practice;
- and to work out a future research agenda, and form possible research collaborations.

The session invites the reputed domain experts (from academia and industry) as the panelists and is organized as follows:

1) Short position papers presented by the invited panelists address the different perspectives of the state-of-the-art and the state-of-the-practice of software process simulation, and provide proposals for improvements.
2) A discussion among the panelists and with the audience, in the second part of the panel, synthesizes our experiences and perceptions, and identifies an initial set of critical challenges and corresponding actions.
3) Based on the onsite statements and discussion, the panel will initiate a joint-statement and a proposal of the research agenda in a follow-up offsite panel meeting during the conference.

During the session, the invited panelists present examples of and experiences with modeling and simulating software
and systems process. Raymond Madachy takes a holistic perspective of software process (simulation) of modeling interactions of processes with other disciplines involved in software and systems engineering; Dan Houston emphasizes the reciprocity of research and practice in order to advance process simulation for industrial engagement; Thomas Brikölzer provides another angle from analogy and comparison between simulation in software process and in other disciplines; Stan Sutton shares with us his broad view of the future of software process modeling and simulation with the focus on problems solving in practice; Jürgen Münch suggests to apply ‘validated learning’ approach to process simulation for better identifying and addressing customers’ needs; He Zhang addresses the challenges for process simulation due to rapidly evolving software processes and suggests possible solutions; and David Raffo discusses the obstacles which inhibit wide adoption of process simulation within industry and opportunities the process research community has to overcome them.

III. Future Work

The special panel is one important step towards the re-stimulation of the SPS related research and practice and the reunion of the community. After the ICSSP 2012 conference, the following activities are planned

1) An online social community and a wiki-forum will be established with the panelists as the initial members to support the regular communications and discussions, information sharing, and potential collaborations.

2) 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).

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

Inmediate term, a session or workshop will be organized for the follow-up discussions, communications, and presentations about the progress towards the goals defined in the research agenda.

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References

