

Summary of the International Conference on Software and System Processes (ICSSP 2016)

[Co-located with ICSE 2016]

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ABSTRACT

The International Conference on Software and Systems Process (ICSSP), continuing the success of Software Process Workshop (SPW), the Software Process Modeling and Simulation Workshop (ProSim) and the International Conference on Software Process (ICSP) conference series, has become the established premier event in the field of software and systems engineering processes. It provides a leading forum for the exchange of research outcomes and industrial best-practices in process development from software and systems disciplines. ICSSP 2016 was held in Austin, Texas, from 14-15 May 2016, co-located with the 38th International Conference on Software Engineering (ICSE). The theme of ICSSP 2016 was studying “Process(es) in Action” by recognizing that the AS-Planned and AS-Practiced processes can be quite different in many ways including their flows, their complexity and the evolving needs of stakeholders. Papers presented at ICSSP discussed this issue addressing different domains, providing concepts, evidence, and experiences.

Categories and Subject Descriptors

D.2.9 [Software Engineering Management]: Software process models

General Terms

Management, Measurement, Documentation, Economics, Human Factors, Standardization

Keywords

software process, control structures, project management, process simulation, process description, tooling, process improvement

1. INTRODUCTION

The main objective of the ICSSP conference series is to provide a forum for discussing challenges, and solutions and advancements in the field of software processes involving academics and practitioners alike. Therefore, ICSSP presents ideas and concepts, experience reports and best practices, and empirical evidence concerning the application of processes for software development and management. Since this addresses a broad field and a multitude of topics, there is a strong need to bring practitioners and scientists together to discuss the role of the software process in current

and future development of complex systems and in rapidly changing markets. In particular, ICSSP 2016 put special emphasis on discussing the challenges regarding the tension of bridging the gap between theory and practice, improving process-readiness for future software and systems development, process improvement and collaboration, and all crucial facets in the development and evolution of software and systems.

ICSSP 2016 accepted full papers (10 pages) and short papers (5 pages). After a careful review, eventually, 7 full and 8 short papers were selected for presentation. In total, approximately 45 participants attended the conference. The ICSSP 2016 proceedings are available for download at [9].

2. ORGANIZATION

The *International Conference on Software and System Processes* (ICSSP 2016) was held on May 14-15, 2016, and was co-located with the 38th *International Conference on Software Engineering* (ICSE). The conference’s website is available online¹. The conference was organized by Dewayne E. Perry (University of Texas, Austin) and David Raffo (Portland State University) as general chairs, and Marco Kuhrmann (University of Southern Denmark, Odense) and Rory V. O’Connor (Dublin City University) as program co-chairs.

3. PROGRAM SUMMARY

The program of the ICSSP 2016 comprised two keynotes, one panel session, and five presentation tracks.

3.1 Keynotes

ICSSP 2016 proudly presented two keynotes given by prestigious speakers.

After the welcome note, James Herbsleb (Carnegie Mellon University) gave the first keynote entitled “*Process in Action, Process in Context*”. In his talk, James argued for aspiring to a more socio-technical and portfolio-oriented view of coordination in which the level of coordination is continuously assessed (teams, sites) to make informed decisions about what tools, techniques,

¹<http://users.ece.utexas.edu/~perry/icssp2016/>

and processes to apply to close any gaps identified. Some insights to an approach and a research agenda rounded out the talk.

Bill Curtis (CAST Research Labs) gave the second keynote “*It’s Not about the Process, It’s about the Organization and Its Products*”. In his talk, Bill states that too much of the emphasis on process focuses on defining, implementing, and ticking off disembodied processes. However, a process is not an end but a means to an end, and it is not always the only means. Bill criticized continuous maturity models as “academic” and “mechanical”, with little understanding of how organizations work. He further described the frequent failure of “best practices” to improve business outcomes. In his talk, Bill proposed that the community refocus process thinking toward, stabilizing local work, creating organizational culture, and embracing skill diversity and social interaction, among other aspects.

3.2 The Panel

A thought provoking and lively panel session was held on the second day chaired by Leon Osterweil (University of Massachusetts, Amherst). The panel further elaborated the conference theme “*Process in Action*” with panel presenters representing a diversity of perspectives from industrial, scientific and academic domains.

Professor Osterweil set the stage with a discussion of the different domains and how work in software and systems process could potentially be applied. He also highlighted some of the current challenges existing in process evolution and application in real world settings.

Jim Herbsleb, Professor at the Institute for Software Research at Carnegie Mellon University, started the panel presentations describing the evolving new development paradigm of social coding which requires higher levels of communication and coordination than have been necessary in the past across diverse and more transparent environments. One can view coordination between project constituents on a spectrum from more formal to more implicit. Process actors engage in more expressive action in the social coding environment and experience more transparency. This transparency on the project acts more as a stage to display everyone’s work. Each commitment counts and is watched by the community. Code is created that relies on frameworks, libraries, and code fragments that are created and controlled by others. This extreme interdependence and visibility (through tools like GitHub) creates a complex ecosystem and a virtuous cycle that is more rigorous and more expansive when one only works within their own organization.

Peri Tarr, Principal Research Staff and Technical Lead at IBM T.J. Watson Research Center discussed the virtues, challenges, and necessities of the DevOps framework in the Cognitive Computing context. Development processes used in this context are agile and continuous for the majority of projects. The challenge is, as Jim Herbsleb’s talk stated, a necessity to rely on services, tools, and code from external cloud based sources controlled by others that are constantly changing. Under the DevOps framework when systems are released, there is constant usage monitoring to keep the system healthy. The extreme challenge is to deliver quality software and services and maintain them in a highly responsive way under tight deadlines in the context of continuous change of the underlying services, tools, and code. The opportunity for the process community from Dr. Tarr’s talk as well as Professor Herbsleb’s talk is create new process paradigms that can include these expanded and increasingly dynamic ecosystems.

The next panel presentation was from Bertram Ludascher, Professor and Director of the Center for Informatics Research and Data in Science and Scholarship at the University of Illinois. This presentation shifted the conversation to the context of scientific workflows and issues related to the automation, scaling, evolution, parallelism, and reuse. Specific mention was made of the need for workflow organization, the management and use of large scientific data sets and analytical tools, the need for reproducibility in the scientific community by independent groups, and reusability of processes by different groups. The opportunity for the process community is that it is possible that significant benefit and improvements could be achieved on a number of the issues faced in this domain by the application of current work in the process community.

The final panel presentation was by Bill Curtis, Senior Vice President and Chief Scientist of CAST Software. Dr. Curtis spoke about the macro context in which the micro process of development projects operates. This macro context includes: the software supply chain, management, risk, and market conditions as well as customers, other stakeholders and budgets. At the executive management level, the main concerns are project risk and company survival. Project management comes down to getting the basics addressed which deal with people, schedule, budget, functionality and quality performance. Process tells us what the expectations are for different process actors but there is a general mismatch in expectations between developers, managers, and customers. The CMMI asks: What processes do you have that assure there will be no risk? There aren’t any. For whatever process is used, the team needs to perform as an orchestra in order to play the complex music of the project. Measurement needs to enable an assessment of the status of the project and risk so that management can be in a position to take appropriate actions.

3.3 The Presentations

Even though ICSSP is an open forum in which all aspects of software processes, related research, and their application in practice are welcome, ICSSP 2016 put strong emphasis on the “Process in Action”, which was also the conference’s motto. In total, 15 papers were accepted addressing this theme emphasizing at least one of the following software and systems engineering aspects:

- Process Description and Design
- Process Tooling
- Process Simulation
- Effort, Cost, and Measurement
- Process Evolution and Improvement
- Process in Practice

Different from previous ICSSP instances, in the paper selection process, we also used topic clusters to determine a paper’s fitting. Figure 1 illustrate the topics addressed as word cloud generated from the papers’ keywords; Figure 2 visualizes the topics based on the papers’ abstracts.

Among the highlights of the presentations, in the field of process adaptation and tailoring, Khelladi et al. [6] presented the challenges of supporting the co-adaptation of process properties, and O’Connor et al. [8] explored the impact of context factors using micro-services (as used to realize DevOps processes) as an example. In the field of process tooling and simulation, Baum et al. [1] presented a comprehensive simulation-based case study on the impact of commit reviews. Effort and cost estimation and measurement are hot topics for the process community. In this filed, for instance, Tanveer et al. [11] presented an industrial case



Figure 1: ICSSP 2016 topic clusters based on keywords.

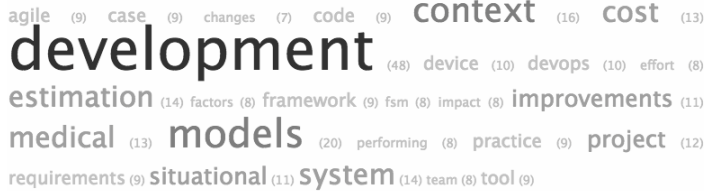


Figure 2: ICSSP 2016 topic clusters based on abstracts.

study on effort estimation in agile software projects, and Huijens et al. [4] presented an exploratory case study on functional size measurement grounded in the system’s code. Process design and improvement as a topic is, for instance, addressed by Diebold and Scherr [2], who studied the question what practitioners really need. Finally, ICSSP 2016 also had a full slot devoted to system evolution and systems in regulated domains. In this topic cluster, Huijens et al. [5] investigated success factors to support the management of legacy system, and Regan et al. [10] presented findings of a trail of a traceability assessment and implementation framework.

Among all the exciting contributions, we had to make a selection of papers to be invited to the special issue of the *Journal of Software: Evolution and Process*. The following papers were invited for extension: Baum et al. [1] (**Best Paper**), Diebold and Scherr [2], Hebig and Derehag [3], Khelladi et al. [6], O’Connor et al. [8], Regan et al. [10], and Tanveer et al. [11].

3.4 ICSSP Community Work

A special aspect in the 2016-instance of ICSSP was the community work. In 2011, ICSSP (co-located with ICSE; Honolulu, Hawaii), among other things, hosted a panel session “Towards a Manifesto for Rich Process” in which, inspired by the Manifesto for Agile Software Development, B. Boehm, P. Kruchten, W. R. Nicols, O. Armbrust, and M. Kuhrmann discussed the need for principles for software processes in general. Results from the panel and complementing discussion were presented at ICSSP 2013 (co-located with ICSE, San Francisco, California) in the special session “A Manifesto for Structured Collaborative Software Processes”, moderated by M. Kuhrmann and A. Rausch. As a major outcome, it was decided to start a joint edited book project. The outcome of this joint endeavor is the book “Managing Software Process Evolution: Traditional, Agile and Beyond – How to Handle Process Change” [7], which is published by Springer and was presented by M. Kuhrmann (for the editors) and R. V. O’Connor (for the chapter contributors).

Having achieved such an outcome as community, in the closing session, M. Kuhrmann presented a new community project: the HELENA survey. HELENA stands for “Hybrid dEveLopmENT Approaches in software systems development” and aims at investigating how the currently available sorts of software processes manifest in practice, notably in current Cyber-Physical Software and Systems development projects in the context of regulated environments. ICSSP 2016 was the starting point for this new com-

munity project and, so far, more than 25 contributors from more than 10 countries collaborate on this project of which outcomes will be presented at future ICSSP instances.

4. FUTURE

In 2017, ICSSP will go to Paris, where ICSSP will celebrate its 10th anniversary and provide its participants with interesting sessions, room for discussion and networking, and a sensational location. ICSSP 2017 will accept research and industry papers, and welcomes poster presentations and workshop proposals. The deadlines are in the beginning of January 2017.

Detailed information can be found at the new ICSSP conference series website: <http://icssp-conferences.org/>

5. ACKNOWLEDGMENTS

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Table 1: ICSSP 2016 Program Committee.

Antonia Mas Pichaco	Marlon Dumas
Barbara Russo	Mary-Ann Lapham
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Mahmood Niazi	Wilhelm Schäfer
Maria-Cecilia Bastarrica	

²<http://users.ece.utexas.edu/~perry/prof/ispa>

³<http://arise.utexas.edu>

⁴<http://english.is.cas.cn>

⁵<http://www.sigsoft.org/>

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