Mingshu Li
Barry Boehm
Leon J. Osterweil (Eds.)

Unifying the Software Process Spectrum

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International Software Process Workshop, SPW 2005
Beijing, China, May 2005
Revised Selected Papers

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Preface

This volume contains papers presented at SPW 2005, the Software Process Workshop held in Beijing, P. R. China, on May 25-27, 2005, and prepared for final publication.

The theme of SPW2005 was "Unifying the Software Process Spectrum." Software process encompasses all the activities that aim at developing or evolving software products. The expanding role of software and information systems in the world has focused increasing attention on the need for assurances that software systems can be developed at acceptable speed and cost, on a predictable schedule, and in such a way that resulting systems are of acceptably high quality and can be evolved surely and rapidly as usage contexts change. This sharpened focus is creating new challenges and opportunities for software process technology. The increasing pace of software system change requires more lightweight and adaptive processes, while the increasing mission criticality of software systems requires more process predictability and control as well as more explicit attention to business or mission values. Emergent application requirements create a need for ambiguity tolerance. Systems of systems and global development create needs for scalability and multi-collaborator, multi-culture concurrent coordination. COTS products provide powerful capabilities, but their vendor-determined evolution places significant constraints on software definition, development, and evolution processes.

The recognition of these needs has spawned a considerable amount of software process research across a broad spectrum. Much of the research has addressed the overall characteristics and needs of software processes, focusing on such issues as process architectures, process behavioral characteristics, and how processes fit with higher-level organizational systems and characteristics. We refer to these investigations as macroprocess research. Simultaneously, there has also been considerable research directed towards the precise, complete, detailed and unambiguous definition of software processes, focusing on such issues as detection of process flaws and facilitation of the human–machine synergies inherent in software processes. We refer to these investigations as microprocess research. A major goal of this workshop was to suggest ways in which to integrate these two complementary lines of research to create a rigorous, orderly discipline of software process engineering. One approach to integration explored at the workshop addressed how high-level process behaviors might be predicted, and modified, through lower-level analyses and optimizations. Another explored how best to integrate objective microprocesses based on explicit knowledge with more subjective collaboration processes based on tacit knowledge.

The workshop achieved its aim of bringing together a critical mass of leading software researchers and practitioners in a forum for assessing current and emerging software process capabilities with respect to the challenges, and for obtaining insights into the software process research directions needed so as to address the challenges and to make progress toward overriding goals. It included initial presentations by leading international software process researchers and users, presentations of contrib-

uted papers on process challenge areas and solution approaches, tool demonstrations, and a closing panel on software process research directions.

In response to the call for papers, 111 submissions were received from 10 different countries and regions: Australia, Canada, China, France, Germany, Hong Kong, Japan, New Zealand, UK and USA. Every paper was rigorously reviewed and held to very high quality standards, and finally 30 papers were accepted as regular papers for presentation at the workshop, representing a 27% acceptance rate for regular papers. In addition, 18 were selected as poster papers.

SPW2005 consisted of five regular sessions — "Process Content" (8 papers), "Process Tools and Metrics" (4 papers), "Process Management" (4 papers), "Process Representation and Analysis" (7 paper) — and "Experience Reports" (7 papers), and a poster session (18 papers). Eight software development support tools were demonstrated in the workshop, including: Cost Xpert Project Estimation Tool of Cost Xpert Group, USA; Spiral Pro of Software Process Group, Inc. USA; Mobile Tools for Requirements Discovery of Johannes Kepler University Linz, Austria; Risk Assessment and Tracking System of RATS Software Research Associates Inc., Japan; Concern-Based Business Process Modeling of IBM China Research Laboratory, China; Performance Testing Tool for Wireless Applications of The Hong Kong Polytechnic University, Hong Kong; Integrated Software Process Services Management System and UDCORE (User-driven Domain-specific COmponent-based Requirements Elicitation tool) of the Institute of Software, Chinese Academy of Sciences, China.

The SPW2005 program was highlighted by 11 keynote speeches, delivered by (in alphabetical order by surname): Victor R. Basili (University of Maryland, "Evolving Defect 'Folklore': A Cross-Study Analysis of Software Defect Behavior"), Barry Boehm (University of Southern California, "The Future of Software Processes"), Jacky Estublier (French National Research Center in Grenoble, "Software are Processes Too"), Watts S. Humphrey (Carnegie Mellon University/SEI, "Software: A Paradigm for the Future"), Ross Jeffery (University of New South Wales and NICTA, "Achieving Software Development Performance Improvement Through Process Change"), Mingshu Li (Institute of Software at the Chinese Academy of Sciences, "Expanding the Horizons of Software Development Processes: A 3-D Integrated Methodology"), Leon J. Osterweil (University of Massachusetts Amherst, "Unifying Microprocess and Macroprocess Research"), Arthur Pyster (Science Applications International Corporation, "What Beyond CMMI Is Needed to Help Assure Program and Project Success?"), H. Dieter Rombach (Fraunhofer IESE & University of Kaiserslautern, "Integrated Software Process & Product Lines"), Wilhelm Schäfer (University of Paderborn, "A Rigorous Software Process for the Development of Embedded Systems"), and Brian Warboys (University of Manchester, "Active Models: A Possible Approach to the Integration of Objective and Subjective Process Models").

Among the 235 registered participants, 50 were from North America, Europe, Australia, and Asian countries outside China. The others were from various Chinese cities, such as Beijing, Shanghai, Nanjing, Xi'an, Wuhan, Chengdu, Changchun, Guangzhou, Shenyang, Kunming, Hangzhou, Changsha, Zhengzhou, Zhuzhou, Luoyang and they covered most of the best universities and research organizations in China.

Chaired by Leon J. Osterweil, SPW2005 ended with a closing panel on the discussion of the future directions for software process research: "Where Are We Now? Where Should We Go Next?" The panelists included: Barry Boehm, Mingshu Li,

Ross Jeffery, and Wilhelm Schäfer, representing SPW 2005 participants from North America, Asia, Australia and Europe, respectively. The panel and audience reached a strong consensus that the future software process challenges were real and significant; that attractive new concepts and capabilities were emerging to address the challenges; and that further research, experimental application, and international collaboration would have significant payoffs. A follow-on workshop is being planned in concert with ICSE 2006 in Shanghai.

A conference such as this can only succeed as a team effort. All of this work would not have been possible without the dedication and professional work of many colleagues. We wish to express our gratitude to all contributors for submitting papers. Their work forms the basis for the success of the workshop. We also would like to thank the Program Committee members and reviewers because their work guarantees the high quality of the workshop. Particular thanks also go to the keynote speakers for giving their excellent presentations at the workshop.

We also wish to express our thanks to the organizers for their hard work. The workshop was jointly organized by four units: ISCAS Laboratory for Internet Software Technologies, China; ISCAS State Key Laboratory of Computer Science, China; USC Center for Software Engineering, USA; and UMASS Laboratory for Advanced Software Engineering Research, USA. We greatly appreciate the financial support from The National Natural Science Foundation of China, the largest national grant managing organization in China for fundamental research. We also want to acknowledge the financial support from the Institute of Software, the Chinese Academy of Sciences, a national research unit for fundamental research and development in software. Finally, we acknowledge the editorial support from Springer for the publication of these proceedings.

For more information, please visit our website at http://www.cnsqa.com/~spw2005.

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