Software process engineering is a time-honored research topic, whose history spans more than two decades. Looking back, it is difficult not to appreciate the full extent of the change that occurred in this field. Once considered a secondary issue with respect to software development techniques, software process research has become the key problem of our day. Early programming tools virtually ignored even the notion of software process; later, development environments began to provide support for specific (usually heavyweight) processes, from early phases like requirements analysis and design down to testing and configuration management. Today, a new generation of tools and environments is playing an increasingly important role in monitoring and controlling the software process. This special issue of the Journal of Systems Architecture (JSA) is aimed at capturing emerging research trends toward quantitative techniques for the identification and governance of flexible, lightweight software processes.

The idea of devoting a journal issue to these topics was born at the 2004 ACM Workshop on QUantitative TEchniques for SoftWare Process (QUTE SWAP). The workshop, closely related to the research project (Agile Methodologies for Software Production) funded by the Italian Research Ministry Fund for Basic Research, was held in held in Newport, CA, in conjunction with the ACM Conference of Fundamentals of Software Engineering (ACM FSE). As the workshop organizers, we appreciated the interest of the audience as well as the high level of quality and timeliness of some of the contributions. With the help of the workshop program committee, we selected the best contributions and invited their authors to develop their research toward full journal papers. After an additional round of refereeing, ten papers were selected that provide novel research results to the software process research community as well as valuable insights to readers interested in the emerging trends of software process research.

Some of the papers in this special issue of JSA present results about distributed, agile software processes (which we see as one of the most substantial trends in current software process research) while others discuss new software process metrics and related measurement middleware, which serves as basis of monitoring real-world software processes spread over various sites. Finally, articles presenting formal and semi-formal models for new development paradigms complete the picture.

While we are very satisfied of the scientific depth and rigorosity of the papers featured in this issue, we hope that they retain at least some of the liveliness and the appeal to nonspecialists of our QUTE SWAP workshop discussions.

Putting together a special issue like this one is always a team effort. We would like to thank a number of friends and colleagues for their valuable help and support, including JSA Editors in Chief K. Kuchcinski and N. Scarabottolo, the reviewers and program committee members, and, above all, the researchers who chose this special issue as the forum to submit their work.

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