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Radical Innovations of Software and Systems Engineering in the Future

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Preface

This volume contains the papers from the workshop “Radical Innovations of Software and Systems Engineering in the Future.” This workshop was the ninth in the series of Monterey Software Engineering workshops for formulating and advancing software engineering models and techniques, with the fundamental theme of increasing the practical impact of formal methods.

During the last decade object orientation was the driving factor for new system solutions in many areas ranging from e-commerce to embedded systems. New modeling languages such as UML and new programming languages such as Java and CASE tools have considerably influenced the system development techniques of today and will remain key techniques for the near future. However, actual practice shows many deficiencies of these new approaches:

- there is no proof and no evidence that software productivity has increased with the new methods;
- UML has no clean scientific foundations, which inhibits the construction of powerful analysis and development tools;
- support for mobile distributed system development is missing;
- for many applications, object-oriented design is not suited to producing clean well-structured code, as many applications show.

As a consequence there is an urgent need for discussing the role of object-orientation and new “post object-oriented” software engineering and programming techniques. The aims of the workshop, continuing the effort to bring together pragmatic and foundational research in software engineering, were three-fold:

- to discuss the actual problems and shortcomings in software and systems engineering, to evaluate potential or partial solutions that have been proposed, and to analyze why some ideas were or were not successful;
- to propose and discuss in a proactive way radically new innovations in software and systems engineering and to present visionary and explorative perspectives and bold ideas for the modeling language, the programming language, the system development method, and the system development process of tomorrow;
- to show how the wealth of past foundational research in software engineering can be uplifted to handle the new problems posed, among others, by the different levels of component and system granularity, the heterogeneity of components, the use of distribution and communication, and the request for appropriate human-interface support.

The workshop program consisted of 36 invited talks by distinguished scientists and practitioners in the field. The participants were invited to submit

a written version of their talks for possible inclusion in these proceedings. All submissions underwent a careful refereeing process by the steering committee and the programme committee. This volume contains the final versions of the 24 contributions that were accepted.

Our sincere thanks go to all the referees who helped reviewing the submissions.

We would like to thank David Hislop for his continuous support of the Monterey workshop series and in particular for helping us organize this workshop in Europe. The financial support of the US Army Research Office¹, the US National Science Foundation, the Münchener Universitätsgesellschaft, and the University of Venice is gratefully acknowledged. Marta Simeoni and several other members of the Computer Science Department of the University of Venice provided invaluable help throughout the preparation and organization of the workshop.

Munich, November 2003

M. Wirsing, S. Balsamo, A. Knapp

¹ The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

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