The Sixth International Conference on Web Engineering (ICWE 2006) held in Palo Alto, California, at the Stanford Linear Accelerator Center, hosted the workshops MDWE, AEWSE and SMIWEP-MATeS. This volume of the ACM Digital Library contains a selection of papers presented at the three workshops which took place on July, 10th and July, 11th.

ICWE 2006 and the associated workshops aim to promote research and scientific exchange related to Web Engineering and to bring together practitioners, scientists and researchers, as well as those interested in learning more about Web Engineering. The Web Engineering discipline comprises the development and use of models, methodologies, technologies, tools and techniques that are used to develop and maintain Web applications within economic constraints. In the era of Web-based information and services we are living in, the development of such Web systems is demanding our attention in order to provide sound and engineered solutions to specific problems in the Web Engineering field. The articles presented at the ICWE 2006 workshops have proposed novel results in this area focusing each on a specific domain:

The Second International Workshop on Model-Driven Web Engineering (MDWE’06) focused on model-based and model-driven development of Web applications. The main goal of this workshop series is to promote the use of models and model transformations as well as the definition of domain specific modeling languages (DSML) and construction of CASE tools supporting model-driven processes. Strengths and weaknesses of model-driven approaches in the Web domain were lively discussed during the workshop.

The First International Workshop on Adaptation and Evolution in Web Systems Engineering (AEWSE’06) aimed at bringing together researchers and practitioners with different research interests, belonging to communities like Web Engineering, Adaptive Hypermedia, User Modeling, Active Databases, Semantic Web, Ontology Evolution, Database Evolution, Temporal Data, Software Engineering and Mobile Computing. The goal of the workshop was to address adaptation and evolution of Web applications both during design, implementation and deployment.

The Joint Workshop on Web Services Modeling and Implementation using Sound Web Engineering Practices and Methods, Architectures & Technologies for e-Service Engineering (SMIWEP-MATeS’06) covered current state-of-the-art and best practices in e-Service engineering, focusing on aspects such as development of semantic Web applications, integration of technologies, requirements engineering, patterns and reference architectures, design methodologies and processes and quality models.

This publication is the result of the effort of many people. We would like to thank the ICWE 2006 Organizing Committee, which supported the workshop organization. The valuable efforts of the workshop organizers have strongly contributed to the success of the workshop program. We are very grateful to the workshop organizers for their engagement and hard work. Our special thanks go to the reviewers, who together with the workshop organizers helped to select the high-quality ongoing works presented in this volume. We would also like to thank all the authors for their co-operation along the process. Last but not least, thanks go to all workshop participants for the fruitful discussions providing feedback to the authors and showing which may be the main concerns of Web engineering research in the near future.

August 2006

Nora Koch and Luis Olsina
ICWE 2006 Workshops and Tutorials Co-chairs
ICWE 2006 Workshop Organization

ICWE 2006 Workshops and Tutorials Co-Chairs

Nora Koch  Ludwig-Maximilians-Universität München, Germany
Luis Olsina  Universidad Nacional de la Pampa, Argentina

MDWE 2006 Organizers

Geert-Jan Houben  Vrije Universiteit Brussel, Belgium
Gustavo Rossi  Universidad Nacional de La Plata, Argentina
Antonio Vallecillo  Universidad de Málaga, Spain

AEWSE 2006 Organizers

Sven Castely, Geert-Jan Houben, Peter Plessers and Olga De Troyer  Vrije Universiteit Brussel, Belgium
Florian Daniel and Maristella Matera  Politecnico di Milano, Italy

SMIWEP-MATeS’06 Organizers

Oscar Corcho and Pedro Sampaio  University of Manchester, United Kingdom
Geert-Jan Houben  Vrije Universiteit Brussel, Belgium
Oscar Pastor  Universidad Politécnica de Valencia, Spain
Daniel Schwabe  PUC-Rio, Brazil
Andreas Wombacher  University of Twente, The Netherlands
Table of Contents

Second International Workshop on Model Driven Web Engineering (MDWE’06)

1. Preface to MDWE’06
   Geert-Jan Houben (Vrije Universiteit Brussel, Belgium)
   Gustavo Rossi (Universidad Nacional de La Plata, Argentina)
   Antonio Vallecillo (Universidad de Málaga, Spain)

2. Pattern-Based Development of User-Friendly Web Applications
   Ina Wentzlaff and Markus Specker (University Duisburg-Essen, Germany)

3. Transformation Techniques in the Model-Driven Development Process of UWE
   Nora Koch (Ludwig-Maximilians-Universität München and F.A.S.T. GmbH, Germany)

4. A UML 2.0 Profile for WebML Modeling
   Nathalie Moreno (Universidad de Málaga, Spain)
   Piero Fraternalli (Politecnico di Milano, Italy)
   Antonio Vallecillo (Universidad de Málaga, Spain)

5. Bridging existing Web Modeling Languages to Model-Driven Engineering: A Metamodel for WebML
   Andrea Schauerhuber, Manuel Wimmer and Elisabeth Kapsammer
   (Vienna University of Technology, Austria)

6. Generating Web Applications from Process Models
   Jan Schulz-Hofen and Silvan Golega (Hasso Plattner Institute for Software Systems Engineering, Germany)

7. Towards an Operational Model for Generated Web Applications
   Mihály Jakob, Holger Schwarz, Fabian Kaiser and Bernhard Mitschang (University of Stuttgart, Germany)

8. Formalizing and Validating UML Architecture Description of Web Systems
   Yujian Fu, Zhijiang Dong and Xudong He (Florida International University, USA)

First International Workshop on Adaptation and Evolution in Web Systems Engineering (AEWSE’06)

9. Preface to AEWSE’06
   Sven Castelyn (Vrije Universiteit Brussel, Belgium),
   Florian Daniel (Politecnico di Milano, Italy),
   Geert-Jan Houben (Vrije Universiteit Brussel, Belgium),
   Maristella Matera (Politecnico di Milano, Italy),
   Peter Plessers and Olga De Troyer (Vrije Universiteit Brussel, Belgium)

    Florian Daniel, Maristella Matera and Giuseppe Pozzi (Politecnico di Milano, Italy)

11. Adaptive Hypermedia as a Means for Learning Programming
    Petr Šaloun and Zdenek Velart (Technické Univerzity Ostrava, Czech Republic)
12. An Author Tool Based on SEMHP for the Creation and Evolution of Adaptive Hypermedia Systems
Fernando Molina-Ortiz, Nuria Medina-Medina (University of Granada, Spain)
Lina García-Cabrera (University of Jaén, Spain)

Ioannis Anagnostopoulos (University of the Aegean, Greece)
Photis Stavropoulos and Georgios Kouzas (Nat. Technical University of Athens, Greece)
Christos Anagnostopoulos and Dimitrios D. Vergados (University of the Aegean, Greece)

14. An Approach to Detection Ontology Changes
Michal Tury and Mária Bieliková (University of Technology of Bratislava, Slovakia)

Joint Workshop on Web Services Modeling and Implementation Using
Sound Web Engineering Practices and Methods, Architectures & Technologies
for e-Service Engineering (SMIWEPS-MATeS’06)

15. Preface to SMIWEP-MATeS’06
Oscar Corcho and Pedro Sampaio (University of Manchester, United Kingdom)
Geert-Jan Houben (Vrije Universiteit Brussel, Belgium)
Oscar Pastor (Universidad Politécnica de Valencia, Spain)
Daniel Schwabe (PUC-Rio, Brazil)
Andreas Wombacher (University of Twente, The Netherlands)

16. A High-Level Specification for Semantic Web Service Discovery Services
Andreas Friesen (SAP Research, Germany)
Egon Börger (Università di Pisa, Italy)

17. Towards Semantic Service Selection for B2B Integration
Andreas Friesen and Kioumars Namiri (SAP Research, Germany)

18. A State Propagation Method for Consistency Checking of Web Service Function Invocations in Web Applications
Tomohiro Kaizu, Tomoya Noro and Takehiro Tokuda (Tokyo Institute of Technology, Japan)

19. Integrating Bioinformatic Data Sources over the SFSU ER Design Tools XML Databus
Yan Liu, Sorna Vincent and Marguerite C. Murphy (San Francisco State University, USA)

20. Ontology Driven Definition of a Usability Model for Second Generation Portals
María Angeles Moraga, Coral Calero and Mario Piattini (University of Castilla-La Mancha, Spain)

21. Extended Web Services Framework to Meet Non-Functional Requirements
Zafar U. Singhera (Cisco Systems, USA)
Abad Shah (University of Engineering and Technology, Pakistan)