Editorial

This special issue of the Journal of Web Engineering contains extended versions of the best papers presented at the 4th International Conference on Web Engineering (ICWE 2004). The conference, held in Munich from 26th to 30th July at the Ludwig-Maximilians-Universität München, was attended by more than 150 researchers and practitioners.

ICWE 2004, following the previous ICWE conferences, aimed at deepening the understanding of the issues related to Web application development. Special attention was paid to emerging trends, technologies and future visions, and to help the academic and industrial communities identify the most challenging tasks for their research and projects.

The ICWE 2004 edition received a total of 204 submissions, out of which 25 high quality papers were selected by the Program Committee as full papers. Additionally, 60 papers describing ongoing research results were included, as either short papers or posters. The selected papers cover a wide spectrum of topics, including Web development processes, design methods, Web usability, security and performance, Web metrics, semantic Web, and personalized and adaptive Web applications.

During the conference, the workshops and the tutorials, the participants could attend excellent presentations and were engaged in very lively discussions on the most challenging technical and methodological issues. The success of this fourth edition demonstrated that the ICWE conference series has become the prominent forum for the Web Engineering community.

The six papers published in this Special Issue show that Web Engineering addresses the pressing need for systematic tool-based approaches to support the development and automatic implementation of Web applications. All the selected works build upon well-known and successful software engineering principles and practices, adapting them to the special characteristics of Web applications. Some of the papers demonstrate the benefits of integrating software engineering techniques with methods stemming from related areas like human-computer interaction, content management, and usability engineering.

The first paper, by Mitsuhisa Taguchi et al., compares annotation-based and diagrammatic approaches for the automatic implementation of consistent and secure Web applications. The comparison is discussed from several viewpoints: application domains, development process, target users, flexibility and scalability. The authors conclude that both approaches are powerful and flexible enough

to construct typical data-centric Web applications. The annotation approach is more advantageous when developing applications in which page templates have flexible layouts. The diagrammatic approach, instead, improves rapid prototyping and iterative/incremental development.

Another important issue in Web software development is the conceptual modelling of applications. This aspect is the focus of the second paper, by Stefano Ceri et al., which addresses the modelling of adaptation policies for personalized applications. The paper explores the combination of two existing approaches: the WebML language for the server-side generation of the Web application and a client-side personalization engine (UML-Guide) for producing additional interfaces and user guides for the adaptive use of the application. The combination of the two systems is shown at work on an adaptive e-learning scenario.

The third paper, by Marco Brambilla and Nicola D'Elia, proposes a method for the management of exceptions within workflow-based Web applications, described through a metamodel and a set of primitives used in the specification. The authors analyze user-generated exception and system failures that typically occur in workflow-based Web applications and yield to data and process inconsistencies. They propose some recovery policies for this exceptions, to restore the workflow back to a correct state and resume the execution process. The theoretical presentation is underpinned with a prototype implementation, which extends their Web development tool WebRatio. Several case studies validate the approach.

The fourth paper, written by Rudi Belotti et al. presents the connection between web design methods and context-sensitivity. The authors describe how a context engine can be used in conjunction with a content management system to provide richer context-aware content to users. Symmetrically, the paper discusses how a content management system can also act as a provider of information for the context engine.

Performance is also a relevant topic in the development of Web applications. The fifth paper, by Daniel Brodie et al., shows how to enhance current caching techniques to improve application performance and content reuse. The authors illustrate a technique for extracting reusable content fragments from dynamically generated pages and present an augmentation of the ESI caching architecture able to cope with fragment movement in cached pages.

The last paper, by Jean Vanderdonckt et al., focuses on languages and tools for the automated evaluation of the accessibility and usability of Web sites. The work relies on factoring out the guidelines evaluation logic from the evaluation engine, and on structuring the evaluation process into three steps: specification of guidelines, page parsing and evaluation. A Guideline Definition Language (GDL) is used to specify guidelines formally and the evaluation tool supports the simultaneous evaluation of multiple guidelines and the use of alternative evaluation strategies.

In summary, we deem that this Special Issue offers a broad-spectrum and up-to-date overview of the current Web Engineering research and an interesting sample of the many challenging problems that are to be faced in this exciting

field.

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