

Introduction to Special Issue on Service Oriented Computing (SOC)

Service oriented computing (SOC) is an emerging cross-disciplinary paradigm for distributed computing that is changing the way software applications are designed, architected, delivered, and consumed. Services are autonomous, platform-independent computational elements that can be described, published, discovered, orchestrated, and programmed using standard protocols to build networks of collaborating applications distributed within and across organizational boundaries. Web services are the current (but not only) most promising technology based on the idea of service oriented computing. Web services provide the basis for the development and execution of business processes that are distributed over the network and available via standard interfaces and protocols.

The proliferation of software services on the Web can be seen as the second wave of evolution in the Internet age. The first era allowed the massive interconnection of personal, business, and government information to a hyperlinked global information infrastructure. The second era enabled the linkage and composition of individual application services, initially on an enterprise scale (beginning with Enterprise Application Integration), and then on a global scale with cross-institutional computing infrastructures flexibly adaptable through dynamic service discovery and composition. The third era is mainly concerned with the linkage and establishment of networked communities composed of software services and people. At this point in time, we still witness research done in all three aspects, with the third domain (linkage of software services and people) increasingly gaining momentum.

This special issue on SOC was well received within the research community. We obtained an incredible number of 71 high-quality submissions from all continents. International experts provided three to five qualified reviews per manuscript. Due to space limitations, we had a hard time selecting just four contributions for inclusion in this special issue.

This outstanding issue is a testament to the efforts of many dedicated individuals. First of all, we want to sincerely thank all reviewers for their hard work and timely response. Of course, we also want to extend our gratitude to all authors who prepared and submitted their research documentation to this special issue, thus making the issue possible. Last but not least, we want to acknowledge the constant support, encouragement, and patience of both Editors-in-Chief, Helen Ashman and Arun Iyengar.

This special issue is composed of four articles. The first article by Belhajjame et al., *Automatic Annotation of Web Services Based on Workflow Definitions*, shows how information can be inferred about the semantics of operation

parameters based on their connections to other (annotated) operation parameters within tried-and-tested workflows. The authors show that despite their imprecise nature these so-called loose annotations are still of value in supporting the manual annotation task, inspecting workflows and discovering services. In the second article, entitled *Correctness-Aware High-Level Functional Matching Approaches For Semantic Web Services*, Elgedawy et al. address the problem of service matching based on high-level functional specifications of Web services consisting of goals, achievement contexts, and external behaviors. They argue that related work approaches trade precision for recall, creating the need for users to choose the adequate services, and thereby establishing a major obstacle for automating the service matching and aggregation processes. The authors present their approach in which the matchmaker automatically determines the correctness of the matching results with respect to the achievement of users' goals.

Ryu et al. present the third article of this special issue, entitled *Supporting the Dynamic Evolution of Web Service Protocols in Service-Oriented Architectures*, in which they address the challenges emerging when dealing with protocol interactions over time. They show that it is important to understand the business protocols that provide clients with the information on how to interact with services. The fourth article by Schäfer et al., *An Environment for Flexible Advanced Compensations of Web Service Transactions*, introduces an environment to deal with advanced compensations based on forward recovery principles. The authors extend the existing Web service transaction coordination architecture and infrastructure in order to support flexible compensation operations.

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