EIC Editorial: Quality-Aware SOA and Applications

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In service-oriented application development, quickly producing a solution is not too hard as long as the architects and developers have a clear architecture as a governing principle. How to make sure your solution is better than others in terms of quality and time-to-market is a big challenge we are facing nowadays. The quality-aware aspects should be effectively reflected in the modeling of individual services or composite services. Multidimensional Services Modeling (M3.1.c) is a key knowledge area to cover an integrated view of static modeling, dynamic modeling, and service-oriented relationship modeling.

Moving quality awareness to the solution level, the knowledge area of Solution-Level Quality of Service (M12.1) in the IEEE Transactions on Services Computing taxonomy has identified the following key topics for effectively building better quality solutions that address the Context-Aware QoS Model (M12.1.a), Representation of the QoS Model (M12.1.b), QoS Data Management (M12.1.c), the Business Relationship Model (M12.1.d), and the Solution-Level QoS Framework (M12.1.e). The security and privacy aspects of the nonfunctional requirement family also contribute to the quality of the solution.

I would like to introduce the following four research papers that are included in the last issue of TSC in 2008. They are clearly covered by this issue’s theme: Quality-Aware SOA and Applications.

The first paper in this issue addresses the timing-oriented dynamic modeling for services composition in the body of knowledge area of Multidimensional Services Modeling (M3.1.c). The paper’s title is “Probabilistic QoS and Soft Contracts for Transaction-Based Web Services Orchestrations” by Sidney Rosario, Albert Benveniste, Stefan Haar, and Claude Jard. This paper proposes a probability distribution for the considered QoS parameter using soft probabilistic contracts. Timing is chosen as an example. The composition process of such contracts can produce a global probabilistic contract for service orchestration.

Trustworthiness is an important metric in the context of solution-level QoS. The second paper is “Tisa: Toward Trustworthy Services in a Service-Oriented Architecture” by Hridesh Rajan and Mahantesh Hosamani. The authors present an extended service-oriented architecture to allow clients, brokers, and providers to negotiate and validate how the requirements are addressed. The integrity of requirements monitoring is enabled on top of a hardware-based root of trust, which provides a way of monitoring requirements and the related execution process in an environment that is not trusted. This paper can be categorized into the body of knowledge area of Trust in Service-Oriented Solutions (M13.0.c) in Services Computing.

The third paper is “CoopFlow: A Bottom-Up Approach to Workflow Cooperation for Short-Term Virtual Enterprises” by Samir Tata, Kais Kbai, and Nomane Ould Ahmed M’barek. The authors present a bottom-up approach to provide a useful artifact for preservation of the privacy of workflows partners, pre-established workflows, and pre-established workflow management systems. This paper concentrates on the knowledge area of Privacy Management in Services Systems (M13.3) in the context of Inter-Enterprise Collaboration (M6.2.a).

Simplicity is another parameter in the quality-aware solution framework. Reducing complexity in solution design is always a challenging topic. In terms of services composition in practices, the last paper makes an attempt to address the simplification issue. This paper is “End-User Service Computing: Spreadsheets as a Service Composition Tool” by Željko Obrenović and Dragan Gašević. The authors present an end-user development paradigm using spreadsheets to simplify the development process of services composition even in a complex scenario. In the proposed framework, the customized spreadsheets can perform service requests and handle responses in various local and remote services settings. Several composition patterns are also illustrated in a spreadsheet-based tool to facilitate service composition. This paper’s approach is proposed in the context of Services Composition (M6) in the TSC taxonomy.

In addition to spreadsheet-based approaches, Web 2.0 and Web X.0 (M11.3.a) technologies provide another promising way of composing services from different sources. However, there are some challenges around the end-to-end traceability enablement in those simplified tooling environments. It is noted that a modern-driven development approach can provide better traceability enablement but needs lots of innovation to produce lightweight model-driven development toolkits.

On the other hand, challenges can always trigger us to think about opportunities and solutions. Foundational changes or incremental innovations are all welcome for addressing real challenges in the field. I do hope you like the four research papers presented in this issue and look forward to your contributions as an author, reviewer, or editorial board member. Especially, I would like to remind you to leverage the well-defined body of knowledge (BoK) areas as a framework to create more innovative research results in the field of Services Computing.

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