

Workshop Summary - International Workshop on Context enabled Source and Service Selection, Integration and Adaptation

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ABSTRACT

This write-up provides a summary of the International Workshop on Context enabled Source and Service Selection, Integration and Adaptation (CSSSIA 2008), organized in conjunction with WWW 2008, at Beijing, China on April 22nd 2008. We outline the motivation for organizing the workshop, briefly describe the organizational details and program of the workshop, and summarize each of the papers accepted by the workshop. More information about the workshop can be found at <http://www.cs.adelaide.edu.au/~csssia08/>.

Categories and Subject Descriptors

H.3.5 [Information Systems]: Online Information Services—*Web-based services*; H.2.8 [Information Systems]: Database applications

General Terms

Design, Management

Keywords

Context awareness, Web service, service and data integration

1. WORKSHOP GOALS

Context awareness refers to the capability of an application or a service being aware of its physical environment or situation (i.e., context) and responding proactively and intelligently based on such awareness [1]. With recent developments in computer hardware, software, networking, and

sensor technologies, context awareness becomes one of the most exciting trends in computing today that holds the potential to make our daily life more productive, convenient, and enjoyable.

Service integration has the purpose of providing the final user with a single unified service, hiding the distribution and heterogeneity of the services provided by the autonomous providers. Generally, service integration approaches have focused more on process modeling and execution aspects than on data integration, while the latter is often the most crucial determiner of successful integration in practice. Through the use of context, a new generation of Web services (i.e., context-aware Web services) is expected to arise for the benefit of coping with the dynamic nature of the Internet. For instance, the best service provider in terms of quality guarantees and cost metrics would differ from time to time. A composite service provider must therefore regularly change the services invoked to provide the best service to his customers. The task of identifying the best service to invoke is the biggest challenge to overcome and necessitates techniques for detecting data and functionality changes in a service, methods for assessing the quality of the service, computing the cost of invocation etc. In addition, comprehensive semantic specifications covering input/output, functional, non-functional and execution aspects of services play an important role to model context [3].

Although the combination of context awareness and Web service composition sounds appealing, injecting context into adaptive service integration and management raises a number of significant challenges, which have not been widely recognized or addressed by the Web services community. Some of them are: a) how to build a model of change: data, process and environment? b) how, when and where to track the provenance of data and meta-data? c) how to define and use effective and practical metrics to manage adaptation: how to compare ability of different services to adapt? How to compare different middleware? d) what is the role of context and how to get the right one?

The objective of CSSSIA 2008 is to provide a forum for researchers and practitioners to exchange new ideas, developments, and experiences on the key technical challenges

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for deployment of context-enabled, adaptive Web services and integrated applications. Discussions focus on where the state of the art is and where the challenges lie, and what practices are needed to enable and sustain a bright future of this research area.

2. WORKSHOP ORGANIZATION

The Organizing Committee of CSSSIA 2008 consists of Quan Z. Sheng, Ullas Nambiar, Amit Sheth, Biplav Srivastava, Zakaria Maamar, and Said Elnaffar. The Technical Program Committee includes 29 internationally active researchers in this area.

The call-for-papers (CFP) of CSSSIA 2008 has been widely circulated in the research community. There were thirteen papers submitted from twelve different countries. All the submissions were of high quality and presented many interesting aspects of Web service discovery, composition and use. Each paper was reviewed by at least three members of the Program Committee. Based on the reviews and the subsequent discussions, the international Program Committee eventually selected six full papers and two short papers. It is our intention to select a sufficient number of papers that would cover, as wide as possible, the majority of core research domains targeted by CSSSIA 2008. The workshop proceedings is published as an ACM International Conference Proceeding Series (AICPS) volume [2], which is available at the ACM Digital Library.

3. WORKSHOP PROGRAM

Prof. Schahram Dustdar from the Vienna University of Technology, Austria gives the keynote speech titled *Research Challenges in Designing Complex Autonomic Service-Oriented Systems*. In his talk, Prof. Dustdar focuses on the increasing need for business processes and software services to attain higher degrees of autonomic, context-aware, and self-adaptive behavior due to the increasing complexity and interdependence of computing devices with the underlying information systems, as well as processes involving humans and software services. He highlights the main research challenges for this class of problems and presents the current state in building the required novel conceptual abstractions as well as needed technological implementations and validations.

Apart from the keynote speech, the program features four sessions. The first three sessions are structured to include presentations by the authors of the accepted papers, followed by a group discussion. The last session is devoted to a panel discussion of important research issues of context-aware service selection, integration, and adaptation.

Finding desired Web services is crucial to the success of many Web services applications. Ma and Zhang in *Efficiently Finding Web Services Using a Clustering Semantic Approach*, present a two-phase approach for efficiently detecting Web services. The paper by Dietze et al. titled *Enabling Context-aware Semantic Web Service Discovery through Conceptual Situation Spaces*, proposes *Conceptual Situation Spaces* (CSS) to capture situational contexts of Web services. CSS are mapped to standardized semantic Web service (SWS) representations such as Web Service Modelling Ontology (WSMO) to enable the context-aware discovery of Web services. In *Using Context to Enable Semantic Mediation in Web Service Communities*, Mrissa et

al., address the problem of semantic heterogeneity between member Web services and service communities by proposing a semantic mediation mechanism. The paper by Yu et al. *Composite Process Oriented Service Discovery with Preserving Business and Timed Relation*, addresses the service selection for composite processes by considering particular requirement context such as timed and business relations among process tasks.

Web service integration is an important technology for the effective automation of application-to-application collaborations. The paper by Harney and Doshi *Speeding Up Web Service Composition with Volatile External Information*, reports a novel method called *informed-presumptive* for fast composing Web services in the presence of external volatile information. Segev in *Circular Context-Based Semantic Matching to Identify Web Service Composition*, describes a work-in-progress that focuses on a new technique for identifying the compositability of two Web services based on contextual similarity. Han et al. in *A New Aggregation Policy for RSS Services*, describe an aggregation algorithm for minimizing the number of missing postings within an aggregation of RSS (Rich Site Summary) services. The paper by Leung et al. *Toward A Model of Service Interaction Enabler in Mobile Environment*, looks at the problem of context-based service interactions in mobile environments. It presents a device capability model for capturing the capability of a mobile device and an approach for analyzing the interaction possibility between devices.

The papers accepted at CSSSIA 2008 cover a wide range of topics in context-aware service selection, integration, and adaptation and present some of the key directions in this research area. Although many of these papers represent early results of ongoing research activities, the work reported in these papers and the research issues raised there make significant contributions in leading to broader discussions on the research and development of context-aware services and applications. We hope the set of selected papers provides the community with a better understanding of the current directions and areas to focus in future.

4. ACKNOWLEDGMENTS

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5. REFERENCES

- [1] G. D. Abowd, M. Ebling, G. Hunt, H. Lei, and H.-W. Gellersen. Context-Aware Computing. *IEEE Pervasive Computing*, 1(3):22–23, 2002.
- [2] Q. Z. Sheng, U. Nambiar, A. P. Sheth, B. Srivastava, Z. Maamar, and S. Elnaffar. *Proc. of the Intl. Workshop on Context enabled Source and Service Selection, Integration and Adaptation (CSSSIA'08)*. Beijing, China, April 2008.
- [3] K. Sivashanmugam, K. Verma, A. Sheth, and J. Miller. Adding Semantics to Web Services Standards. In *Proc. of the 2003 International Conference on Web Service (ICWS'03)*, Las Vegas, Nevada, USA, June 2003.