Editorial Preface

The Lifecycle of Services Computing Innovations

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BACKGROUND

Services now account for more than half of the U.S. economy. Services Computing has become a cross-discipline that covers the science and technology of services innovation research and development. This leverages IT and computing technology to model, create, and manage business solutions, scientific applications, as well as modernized services. The core technology suite includes Web Services and service-oriented architecture (SOA), business consulting methodology and utilities, business process modeling, transformation and integration. The goal of Services Computing is to enable IT services and computing technology to perform business services more efficiently and effectively (Zhang, 2005).

THE LIFECYCLE OF SERVICES COMPUTING INNOVATIONS

The lifecycle of Services Computing innovations includes enterprise componentization, services modeling, services creation, services realization, services annotation, services deployment, services discovery, services composition, services delivery, service-to-service collaboration, services monitoring, services optimization, as well as services management. Figure 1 describes the role that Services Computing plays in bridging the gap between application systems that needs to be increasingly agile to meet the requirements of business change cycle that is constantly shrinking and various technologies such as the Internet & networking, database, software engineering, and parallel and distributed computing.

In the past, we have responded to these requirements with the development of new technology, new programming language, etc. However, this approach is not sufficient to deliver magnitude improvement which is required by the businesses. Thus, on the one side, Services Computing interfaces with applications like multimedia systems, manufacturing solutions, finance applications, communication services, and e-commerce. On the other side, it interfaces with technologies like the Internet, Web & networking, database, software engineering, and parallel & distributed system.

The Services Computing discipline is creating what will become one of the most significant industries of the new century. We recognize the potential value that the Services Computing research topics may bring to our research and engineering community.

ABOUT THIS ISSUE

This issue of the International Journal of Web Services Research (JWSR) collects five papers that span from Web service response time enhancement, state management and formalization of Web services composition, semi-automatic Web services discovery, and a case study of authorization framework of Web services.

Shahram Ghandeharizadeh et al. investigate the performance of XML and binary formatters and the role of compression technique to reduce the response time of Web services. They consider it important to balance between the gain from compression and the overhead caused by
Network Adaptable Middleware (NAM) is presented to help make decisions based on various factors such as data characteristics of a Web service, available client and server processor speeds, and network characteristics. NAM reduces response time of non-multimedia Web services using compression techniques when appropriate.

Michael Weiss and Babak Esfandiari propose an approach that models unexpected interactions between Web services, and automatically detects and resolves feature interactions among Web services. Based on goal-oriented analysis and scenario modeling, their approach allows reasoning about feature interactions in terms of goal conflicts and feature deployment. Three case studies are reported to illustrate the use of the approach.

Qianhui Althea Liang and Stanley Y.W. Su formalize the Web service composition problem into a search problem in an AND/OR graph. A search algorithm is presented to search a graph to identify potential composite services that satisfy a Web service request. Interactions with service requesters lead to the update of the graph; the algorithm can be repeatedly applied to the updated graph to search for alternative templates until the result is approved.

Xiang Fu et al. consider it critical for Web services composition to analyze the realizability problem, which decides whether a Web service composition can be synthesized and generate desired conversations specified by a predefined conversation protocol. They take into consideration message contents for accurate realizability analysis. To overcome potential state-space explosion caused by the message contents, they propose symbolic analysis techniques for the realizability conditions.

Finally, Sarath Indrakanti et al. analyze the design issues of establishing an authorization framework for Web services, especially the features required for an authorization policy language. They propose extensions to the .NET MyServices authorization service to support a range of authorization policies required in commercial systems. A healthcare system built using Web services is used as a case study to prove the
effectiveness of their extended authorization model.

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REFERENCES


Liang-Jie Zhang, PhD, is a research staff member and chair of the Services Computing Professional Interest Community at IBM T.J. Watson Research Center. He has been leading the Service-Oriented Architecture and Web Services for Industry Solutions and Services Research since 2001. He has 20 issued patents and an additional 30 patent applications in the areas of e-business, Web services, rich media, data management, and information appliances, and has published more than 80 technical papers in journals, book chapters and conference proceedings. From 2004 to 2005, as a core member of the CTO team of Global Industrial Sector at IBM Sales and Distribution, he coordinated the technology strategy for Automotive Industry, Electronics Industry, Aerospace and Defense Industry, Chemical and Petroleum Industry, and Product Lifecycle Management. Dr. Zhang was also the chief architect of Industrial Standards at IBM Software Group, where he was responsible for defining standards strategy to move industry solutions to service-oriented architecture. Dr. Zhang is an IEEE senior member and founding chair of the IEEE Computer Society Technical Committee on Services Computing. He was the general chair of the 2004 IEEE International Conference on Web Services (ICWS 2004) and the general co-chair of the 2004 IEEE Conference on E-Commerce Technology (CEC 2004). He is the editor-in-chief of the International Journal of Web Services Research (JWSR), which has been included in EI Compdenx since 2005. Dr. Zhang received a BS in electrical engineering at Xidian University in 1990, an MS in electrical engineering at Xi’an Jiaotong University in 1992, and a PhD in pattern recognition and intelligent control at Tsinghua University in 1996.