

Semantic Web Services and Their Role in Enterprise Application Integration and E-Commerce

Special Issue of the International Journal of Electronic Commerce (IJEC)
(<http://www.gvsu.edu/ssb/ijec/>)

Christoph Bussler
Oracle Corporation
500 Oracle Parkway
Redwood Shores, CA 94065, U. S. A.
ChBussler@aol.com

Dieter Fensel
Institut für Informatik
Next Web Generation Research Group
Leopold Franzens Universität Innsbruck
Technikerstraße 25
6020 Innsbruck, Austria
Dieter.Fensel@uibk.ac.at

Norman Sadeh
eCommerce Institute - WeH 1325
ISRI - School of Computer Science
Carnegie Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213-3891, U. S. A.
Sadeh@cs.cmu.edu

1 Introduction

This special issue of the International Journal of Electronic Commerce (IJEC) focuses on the proposed intersection of three domains that have very recently started drawing enormous attention throughout academia and industry and is of utmost importance as well as relevance for computer science and the business world:

- **Web Service Technology** (manifested through SOAP, WSDL and UDDI)
- **Semantic Web Technology** (manifested through ontology languages) and

- **Enterprise Integration** (manifested through Enterprise Application Integration (EAI) and E-Commerce in form of Business-to-Business (B2B) Integration as well as Business-to-Consumer (B2C)).

The promise is that Web Service Technology in conjunction with Semantic Web Technology ('Semantic Web Services') will make Enterprise Integration dynamically possible for all types and sizes of enterprises compared to the 'traditional' technologies, such as Electronic Data Interchange (EDI) or Value Added Networks (VANs). In addition, Enterprise Integration will become more reliable as well as easier to achieve without the low-level implementation problems that can be observed in today's approaches.

Because these strong promises are made a series of questions arises: to what extent are these different technologies already integrated today? How does the combination of those technologies look like? How does this combination make the Enterprise Integration problem easier to solve and the solution more reliable?

'Traditional' technologies exist (in some cases for over 30 years) and significant progress has been made over time due to the lessons learned in the real world and sometimes in large scale deployments. Today, the major problems of Enterprise Integration in EAI and E-Commerce are:

- **Semantic Unification.** Data exchanged between application systems or trading partners (endpoints) are defined based on different schemas. When data are exchanged in the form of messages, a data mediation problem arises that requires resolution. A minor and related issue is that different application systems or trading partners use different forms of syntax, too, in addition to different schemas for messages. Even if endpoints describe their data in the form of ontologies, the semantic unification problem remains to be solved.
- **Message Behavior.** Different endpoints expect specific messages in a specific order and with specific sequencing. Communicating endpoints have to guarantee and to enforce the exchange behavior as agreed to establish interoperability.
- **Endpoint Discovery.** The manual establishing of trading relationships is considered error prone, slow and inflexible. Discovery mechanisms are put in place (for example in the form of UDDI) that promise to make the automatic discovery process easier and more reliable.
- **Message Security and Trust Relationships.** Communicating endpoints require assurance of message confidentiality and non-repudiation. Various security schemes are being developed that attempt to address these requirements. Furthermore, endpoints need to establish sufficient trust to engage in a trading relationship.
- **Process Management.** Supply-chain processes are very complex and highly dynamic. Attempts have been made to enable dynamic supply-chain reconfiguration with agent technology and dynamic workflow technology. A large body of work exists that has not yet found its way into industry and real applications.

- **Integration Standards.** A mind-boggling number of standards exists in the area of Enterprise Integration. All of these have to be dealt with to some extent by the various enterprises.
- **Legacy Application Connectivity.** Most data that are communicated are managed by existing application systems that are not necessarily designed to be integrated. Adapter technology exists that allows to connect easily to application systems.

Traditional technologies are able to address all these major problems today. They can implement Enterprise Integration predictably and reliably. However, new technologies like Web Services Technology in combination with Semantic Web Technology have (or have not?) the potential to address these requirements much better.

The special issue on 'Semantic Web Services and their Role in Enterprise Application Integration and E-Commerce' seeks contributions that address the Enterprise Integration problems with the new technologies. Articles are sought that address specifically the intersection of Web Service Technology, Semantic Web Technology and Enterprise Integration. It is the goal to show the relevance and applicability of the new integration technologies in that they provide a 'better' solution to well-understood problems in the EAI and E-Commerce space. Contributions are encouraged to make a very good and well-founded case for the new technologies based on rigorous and solid arguments. However, contributions that are critical in nature based on a solid argumentation and also state the deficiencies that have to be overcome are equally welcome.

Articles that 're-wrap' or 're-sell' existing work or achieved results with the new technologies are not considered relevant for the special issue. Abstract articles that provide conceptual models or architectures without clearly proving their applicability to real-world problems and in real-world situations are not the focus of the special issue, either. Articles that focus only on a small subset of the problems or requirements of Enterprise Integration are not sought; these are typically targeted toward scientific conferences.

2 Timeline

- Submission date: May 31st, 2003
- Acceptance notification: September 30th, 2003

3 Submission Instructions

- Please submit articles for this special issue following the formatting instructions below on or before the submission date to Christoph Bussler at ChBussler@aol.com (and **not** to the IJEC Editor-in-chief Vladimir Zwass as the IJEC web site requires).
- The formatting instructions for submissions can be found at the IJEC web site <http://www.gvsu.edu/ssb/ijec/> following the link "Submissions".