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Presentation

Web Services from An Industrial and An Academic Perspective

Jose Carlos del Arco-Prieto, Jesús Arias-Fisteus, Óscar Corcho-García and Jorge Cardoso

Web Services have gained great importance in academic and industrial environments due to their focus on open standards widely accepted by industry, which guarantee interoperability between the information systems of different organizations.

The emergence of Web Services has had a major impact on the way in which organizations integrate their applications, data, and processes. The use of standards has reduced the cost of corporate integration projects by allowing the

reuse of existing applications and benefiting from previous investments. Web Service adoption in the industry has allowed organizations to share information with their partners, providers, and customers in a standardized manner.

In academia, the number of papers, conferences, projects, and research lines focusing on Web Services related aspects has grown in the last years. Research is focused on the implications of applying Web Services to areas such as B2B, EAI, BPM, EC, Grid Computing, and Semantic Web. Web

The Guest Editors

Jose Carlos del Arco-Prieto is a graduate in Computer Science from the *Universidad de Huelva* (1998). Later his professional career began in Teccsidel (1999) where he participated in projects for Telefónica I+D and made analyses of the impact of Web Services on different markets (2002). In 2004 he worked in the *Diputacion de Huelva* (Huelva Provincial Council) participating in the European project "Regions on Line" (ROL). In 2005 he worked in Cibernos collaborating on the Diraya project led by Indra and participating in the development of proposals of interoperability models and Web Services-based integration. He is currently working for T-Systems, doing technical consultancy work and collaborating in the definition of interoperability models, integration for the public sector, and the design of methodologies for SOA development. He collaborates with the *Universidad de Huelva* in the promotion of Web 2.0 technologies. He is the father of the first Web Services Latin list (webservices-Latinos), promoter of JSWEB 2005 Workshop, Co-president of JSWEB 2006 Workshop and a member of the steering committee of European SOA & Application Architecture Conference (2007). One of his main interests is the convergence between the worlds of academia and business. <josecarlos.delarco@t-systems.es>.

Jesús Arias Fisteus works as an assistant professor in the Telematic Engineering Department of the *Universidad Carlos III de Madrid*. He received his MSc with honours in Telecommunication Engineering in 2001 from the *Universidad de Vigo*. In 2005, he received his PhD in Communication Technologies from the *Universidad Carlos III de Madrid*. His research topics include the application of formal methods, especially model checking, to the verification of business processes and Web Service compositions. Recently, he has also become interested in the Semantic Web and Semantic Web Services. He has worked on several European and Spanish research projects related to the field of Web Services. He has also authored more than 15 papers in national and international journals and workshops/conferences in related fields. He was a temporary research visitor at the IT Innovation Centre at Intel

Ireland in 2004, and a visiting scientist under the direction of Prof. Tim Berners-Lee at the Decentralized Information Group of the Massachusetts Institute of Technology in 2006. <jaf@it.uc3m.es>.

Óscar Corcho-García works as a Marie Curie fellow at the University of Manchester. Previously, he has worked at iSOCO as a research manager and at the Ontological Engineering Group of the *Universidad Politécnica de Madrid* (UPM). He graduated with honours in Computer Science from UPM in 2000, obtained his MSc in Software Engineering from UPM in 2001, and his PhD in Artificial Intelligence in 2004. He received the third Spanish award in Computer Science from the Spanish Government (2001) and a PhD thesis award from the *Universidad Politécnica de Madrid* (2005). His research activities include the Semantic Grid, the Semantic Web, and ontology engineering. He has participated in several leading EU projects in these areas: OntoGrid, Esperanto, DIP, HOPS, SWWS, Knowledge Web, OntoWeb, and MKBEEM. He has also taken part in the HALO project, funded by Vulcan, Inc. He has published the books "Ontological Engineering" and "A layered declarative approach to ontology translation with knowledge preservation", over 30 journal and conference/workshop papers, and he reviews papers in several conferences, workshops and journals. He has also been a research visitor at KMI (Open University) and SMI (Stanford University). He chaired the demo/industrial sessions at EKAW2002, co-organized the ISWC2003 and ISWC2004 Workshops on Evaluation of Ontology Tools (EON2003, EON2004) and was the sponsor chair of the ESWC2006 conference. <oscar.corcho@manchester.ac.uk>.

Jorge Cardoso joined the *Universidade de Madeira* in March 2003. He previously lectured at the University of Georgia (USA) and the *Instituto Politécnico de Leiria* (Portugal). While at the University of Georgia he formed part of the LSDIS Lab where he performed extensive research on Workflow Management Systems. His current interests include Workflow Quality of Service, Semantic Workflow Composition, Web Services, Web Processes, e-Commerce, and Groupware/CSCW. <jcardoso@uma.pt>.

Services have been crucial to the emergence of such paradigms as *Service Oriented Architectures* (SOAs).

This special issue contains a number of papers related to the industry and academic world describing the state of the art of Web Services, fundamental approaches and frameworks, work in progress, and the impact of this technology on different types of applications.

The issue kicks off with the paper "*Web Services: Introduction and State of The Art*", prepared by the issue's editors with the aim of introducing the world of Web Services. This paper presents a general overview of the implications of Web Services in different industrial and academic areas.

The *World Wide Web Consortium* (W3C) is the most important standardization consortium in the field of Web technologies. It has developed and standardized a number of key Web technologies such as XML and the latest versions of HTML. The paper "*W3C and Web Services Standardization*", authored by **Martín Álvarez-Espinar** from the W3C Spanish Office, explains the mission of the W3C and its important role in the standardization of Web service technologies.

The paper "*Integration and Interoperability Experiences in Healthcare*", by **Antonio García-Landeira**, gives an example of how Web Services are applied in the Health sector to integrated Hospital Information Systems. This integration effort follows the basic principles of *Service Oriented Architectures* (SOAs) and *Enterprise Service Buses* (ESBs).

The paper "*Model-Driven Extra-Functional Property Development for Web Services: a Case Study from the Service and Client Side Perspectives*", by **Guadalupe Ortiz-Bellot** and **Juan Hernández-Núñez**, proposes a multidisciplinary approach that uses *Model Driven Development* (MDD), *Services Component Architecture* (SCA) and *WS-Policy* to integrate non-functional properties in service models, and the administration of such properties by service clients.

The paper "*Semantic Web Services with WSMO*", from

Holger Lausen, Jos de Bruijn, Uwe Keller and Rubén Lara deals with the role of Semantic Web Services in the formal specification of services, allowing the automation of their localization and use. WSMO provides an infrastructure for the description of Semantic Web Services enabling the specification of services, and supports mediation in order to overcome interoperability problems.

On the subject of Service Level Agreements and Contracts we would highlight the paper "*Towards An Automated Trading Process*", by **Pablo Fernandez-Montes, Manuel Resinas-Arias de Reyna and Rafael Corchuelo-Gil**, which focuses on the automatic provision of services based on Service Level Agreements between provider and clients, and describes the activities involved in the service negotiation process and its application in different scenarios.

Service selection is a hot topic in Semantic Web Services. The paper "*Towards Semantic Service Selection for B2B Integration*", by **Andreas Friesen and Kioumars Namiri** describes a solution for the dynamic selection of Web services based on the semantic interpretation of the capabilities of the services offered and of the parameters specified at run-time.

The paper "*Leveraging E-Marketplace Models for Web Service-Based Application Development*", by **Abraham Nieva-de la Hidalga, Liping Zhao and Pedro R. Falcone-Sampaio** proposes the application of the current e-marketplace model to the development of Web Service-based applications.

We would like to thank the authors for contributing their papers and the editors of *Novática* and *UPGRADE* for their help during the edition of this special issue. We hope that this issue will be also helpful for readers of *Novática* and *UPGRADE*.

Below we provide some relevant references about the world of Web Services for those readers who wish to go into this area in greater depth.



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<http://www.upgrade-cepis.org/pages/upenet.html>

Useful References on Web Services

The following references, along with those included in the articles this monograph consists of, will help our readers to dig deeper into this field.

Books:

- E. Newcomer, G. Lomow. *Understanding SOA with Web Services*, Addison-Wesley, 2005. ISBN: 0-321-18086-0.
- S. Weerawarana, F. Curbera, F. Leymann, T. Storey, D. Ferguson. *Web Services Platform Architecture*, Prentice Hall, 2005. ISBN: 0-131-48874-0.
- G. Alonso, F. Casati, H. Kuno, V. Machiraju. *Web Services. Concepts, Architectures and Applications*, Springer, 2004. ISBN: 3-540-44008-9.
- Douglas Barry. *Web Services and Service-Oriented Architectures. The Savvy Manager's Guide*, Morgan Kaufmann, 2003.
- Doug Kaye. *Loosely Coupled. The Missing Pieces of Web Services*, Kaye, 2003. ISBN: 1-881-37824-1.
- "Actas JSWEB'2005". Editores: E. Marcos, J. Alonso, V. de Castro, J. del Arco. Thompson, 2005.

Magazines and Journals:

- SOA Web Services Journal: <<http://webservices.syscon.com/>>.
- Business Integration Journal: <<http://www.bijonline.com/>>.
- International Journal of Web Services Research: <<http://www.idea-group.com/journals/details.asp?id=4138>>, <<http://www.servicescomputing.org/jwsr/>>.
- International Journal of Web and Grid Services: <<https://www.inderscience.com/browse/index.php?journalID=47>>.
- SOA Magazine: <<http://www.soamag.com/>>.

Conferences:

- ICWS 2005: <<http://conferences.computer.org/icws/2005/>>.
- ICWS 2006: <<http://conferences.computer.org/icws/2006/>>.
- JSWEB 2005: <<http://www.w3c.es/Eventos/ServiciosWeb/>>.
- JSWEB 2006: <<http://www-gsi.dec.usc.es/jsweb06/>>.
- ECOWS 2006: <<http://www.ifi.unizh.ch/ecows06/>>.

Websites:

- W3C: <<http://www.w3.org/>>.
- OASIS: <<http://www.oasis-open.org/>>.
- WS-I: <<http://www.ws-i.org/>>.
- Webservices.org: <<http://www.webservices.org/>>.
- SearchWebservices.com: <<http://www.searchwebservices.com/>>.

Discussion lists:

- Service-orientated-architecture: <<http://groups.yahoo.com/group/service-orientated-architecture/>>.
- www-ws@w3.org: <<http://lists.w3.org/Archives/Public/www-ws/>>.
- public-sws-ig@w3.org: <<http://lists.w3.org/Archives/Public/public-sws-ig/>>.

- webservices-latinos: <<http://es.groups.yahoo.com/group/webservices-latinos/>>.
- soapbuilders: <<http://groups.yahoo.com/group/soapbuilders/>>.
- rest-discuss: <<http://groups.yahoo.com/group/rest-discuss/>>.

Glossary of terms:

ACM	Association for Computing Machinery
AOP	Aspect Oriented Programming
API	Application Programming Interface
ASP	Application Service Provider
B2B	Business to Business
B2Bi	Business to Business Integration
BPI	Business Process Integration
BPM	Business Process Management
BPMI	Business Process Management Initiative
BPO	Business Process Outsourcing
CORBA	Common Object Request Broker Architecture
CRM	Customer Relationship Management
DCOM	Distributed Component Object Model
EAI	Enterprise Application Integration
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
ESB	Enterprise Services Bus
ebXML	Electronic Business XML Initiative
HTTP	Hypertext Transport Protocol
IEEE	Institute of Electrical and Electronics Engineers
JMS	Java Message Service
JSR	Java Specification Requests
J2EE	Java 2 Platform Enterprise Edition
J2ME	Java 2 Platform, Micro Edition
J2SE	Java 2 Platform, Standard Edition
MDA	Model Driven Architecture
MOM	Messaging Oriented Middleware
OGSA	Open Grid Services Architecture
OGSI	Open Grid Service Infrastructure
OMG	Object Management Group
OASIS	Organization for the Advanced Structured Information Standards
QoS	Quality of Service
RPC	Remote Procedure Call
SCM	Supply Chain Management
SLA	Service Level Agreement
SOA	Services-Oriented Architecture
SOAP	Simple Object Access Protocol
UDDI	Universal Description, Discovery and Integration
URL	Universal Resource Locator
VAN	Virtual Area Network
W3C	World Wide Web Consortium
WS-BPEL	Business Process Execution Language
WSDL	Web Services Description Language
WSRF	Web Services Resource Framework
WSRP	Web Services for Remote Portlets
XML	Extensible Markup Language