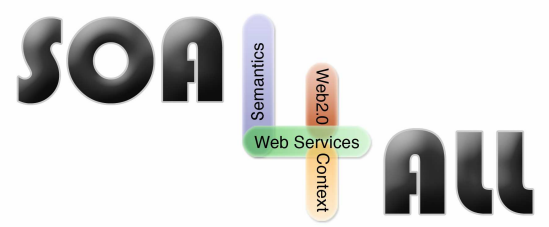

Project Number: **215219**

Project Acronym: **SOA4ALL**

Project Title: **Service Oriented Architectures for All**

Instrument: **Integrated Project**

Thematic Priority: **Information and Communication Technologies**

D13.1.1 Baseline Training Tutorial

Activity N:	A4 - Exploitation and Impact Activities
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Dissemination Level		
PU	Public	**X**
PP	Restricted to other programme participants (including the Commission)	
RE	Restricted to a group specified by the consortium (including the Commission)	
CO	Confidential, only for members of the consortium (including the Commission)	

Version History

Version	Date	Comments, Changes, Status	Authors, contributors, reviewers
1.0	30/04/2008	First version of the deliverable	Vlad Tanasescu (OU) Carlos Pedrinaci (OU)

Table of Contents

Glossary of Acronyms

Acronym	Definition
D	Deliverable
DL	Description Logics
EC	European Commission
OASIS	Organization for the Advancement of Structured Information Standards
SOA	Service Oriented Architecture
WP	Work Package
WSML	Web Service Modelling Language
WSMO	Web Service Modelling Ontology

1. Executive summary

This document describes the tutorials on background technologies given in Madrid on March 25th 2008 to the participants of the project's kick-off meeting. The aim of the tutorials was to update the participants with knowledge about the technologies used in the project. The tutorial sessions, chaired by Prof. John Domingue (OU) covered the following topics:

1. WSMO - including the variants under construction;
2. SEE - the SWS architecture developed under a number of projects and OASIS;
3. Semantic spaces - as developed in TripCom;
4. Web 2.0 (human computation, easy to use interfaces, mashups, wikipedia, recommendation systems, tagging); and
5. Reasoning in the WSML Family

This document provides more information about the speakers and the participants and gives detailed information about the content of each tutorials.

2. Introduction

2.1 Introductory explanation of the deliverable

This document describes the tutorials on background technologies given in Madrid on March 25th 2008 to the participants of the project's kick-off meeting.

The following topics were covered:

1. WSMO - including the variants under construction;
2. SEE - the SWS architecture developed under a number of projects and OASIS;
3. Semantic spaces - as developed in TripCom;
4. Web 2.0 (human computation, easy to use interfaces, mashups, wikipedia, recommendation systems, tagging); and
5. Reasoning in the WSML Family

2.2 Purpose and Scope

The aim of the tutorials was to update the participants with knowledge about the technologies used in the project.

2.3 Structure of the document

This document provides more information about the speakers and the participants in the first section and gives details about the content of each tutorial, in the following five sections.

3. The specification of the deliverable

This deliverable describes the tutorials on background technologies given in Madrid on March 25th 2008 to the participants of the project's kick-off meeting.

The following topics were covered:

1. WSMO - including the variants under construction;
2. SEE - the SWS architecture developed under a number of projects and standardised within OASIS;
3. Semantic spaces - as developed in TripCom;
4. Web 2.0 (human computation, easy to use interfaces, mashups, wikipedia, recommendation systems, tagging); and
5. Reasoning in the WSML Family

In the first section, we provide more information about the speakers and the participants. We then give details about the content of the tutorials, in the following five sections (1 section per tutorial).

3.1 Speakers and Agenda

The tutorials on background technologies were given in Madrid, on March 25th 2008, between 12:00 and 16:00 to the participants of the project's kick-off meeting. The aim of the tutorials was to update the participants with knowledge about the technologies used in the project. Prof. John Domingue (OU) chaired the tutorial sessions and introduced WSMO. Michal Zaremba (UIBK) introduced SEE. Jacek Kopecký (UIBK) described Semantic Spaces. He then introduced Web 2.0 together with Tomas Vitvar (UIBK). Barry Bishop (UIBK) introduced WSML variants.

Table 1 provides the abstract of the kick-off meeting agenda in which the tutorials took part.

Table 1: kick-off meeting agenda abstract

12:00-13:30	**Tutorials on Background Technologies. Chairperson: John Domingue (OU)** WSMO - including the variants under construction – **John Domingue (OU)** SEE - the SWS architecture developed under a number of projects and OASIS – **Michal Zaremba (UIBK)** Semantic spaces - as developed in TripCom – **Jacek Kopecký (UIBK)**
13:30 – 15:00	**LUNCH**
15:00 – 16:00	**Tutorials on Background Technologies. Chairperson: John Domingue (OU) (continuation)** Web 2.0 (human computation, easy to use interfaces, mashups, wikipedia, recommendation systems, tagging) – **Jacek Kopecký and Tomas Vitvar (UIBK)** Reasoning in the WSML Family **– Barry Bishop (UIBK)**

3.2 Participants

3.3 WSMO

John Domingue (OU) introduced WSMO, the Web Service Modelling Ontology. WSMO is an ontology for describing the various aspects of services to enable the automation of WS discovery, composition, mediation and invocation. WSMO is based on the following design principles:

- Web Compliance
- Ontology-Based
- Strict Decoupling
- Centrality of Mediation
- Ontological Role Separation
- Description versus Implementation Execution Semantics
- Service versus Web service

The meta-model of WSMO defines four top level elements: *Ontologies*, *Goals*, *Web Services*, and *Mediators*.

Ontologies provide the foundation for describing domains semantically. They are used by the three other WSMO components. *Goals* define the tasks that a service requester expects WSs to fulfil. In this sense, they tend to reflect the service user's intent. *Web Service* descriptions represent, in terms of capabilities (what the service can do) and interface (how to use it), the behaviour of a deployed Web Service. The description also indicates how WS communicate (choreography) and how they are composed (orchestration). *Mediators* handle issues of data and process interoperability that arise between heterogeneous systems. One of the characterizing features of WSMO is that all components – Ontologies, Goals and Web Services – are linked by Mediators. In particular, WSMO provides four kinds of mediators:

- oo-mediators for mediating between heterogeneous ontologies;
- ww-mediators connect WS to WS;
- wg-mediators connect WS with Goals;
- gg-mediators link different Goals, solving input conflicts and transforming processes.

3.3.1 Relevant URLs

The Presentation:

- http://kmi.open.ac.uk/projects/soa4all/presentations/tutorials/kom/wsmo.pdf (or see annex A).

For WSMO:

- http://www.wsmo.org/

Conceptual Models of Services

- http://cms-wg.sti2.org/

3.4 SEE

Michal Zaremba (UIBK) introduced SEE, the SWS architecture developed under a number of projects and OASIS. SEE, the Semantic Execution Environment is based on the WSMO conceptual model and has a reference implementation (WSMX).

SEE's guiding vision is to provide guidelines, justifications and implementation directions for

an execution environment for Semantic Web Services. For this SEE has to define an execution environment capable of managing all the aspects related to semantically enhanced Web services, to enable their discovery, selection, mediation and execution. Ultimately it will provide a WSMO test bed and demonstrate the viability of using WSMO as a means to achieve dynamic inter-operation of Web services.

3.4.1 Relevant URLs

The Presentation:

- http://kmi.open.ac.uk/projects/soa4all/presentations/tutorials/kom/semantic-execution-environment.pdf (or see annex A).

For OASIS SEE Technical Committee:

- http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=semantic-ex

3.5 Semantic Spaces

Jacek Kopecký (UIBK) introduced Semantic Spaces, as developed in Tripcom. Semantic spaces, or Triple Spaces are inspired by research on Tuple space. The provide:

- Persistent publication of semantic data;
- Retrieval by semantic matching;
- Mediation of data between heterogeneous services;
- Semantics-aware distribution of data;
- Coordination of concurrent access situations;
- Appropriate security and trust mechanisms;
- Use of Web service protocol stack and Semantic Web technologies.

Being a communication medium as well as a means of coordination and an indirection in space and time, semantic spaces enable powerful data access and mediation in face of heterogeneities.

3.5.1 Relevant URLs

The Presentation:

- http://kmi.open.ac.uk/projects/soa4all/presentations/tutorials/kom/semantic-spaces.pdf (or see annex A).

TripCom Project:

- http://www.tripcom.org/

3.6 Web 2.0

Jacek Kopecký and Tomas Vitvar (UIBK) introduced Web 2.0. The questions addressed where:

- What is Web 2.0?
- What technologies does Web 2.0 comprise?
- Which Web 2.0 technologies are useful in SOA?

Web 2.0 is mainly a web that is writable, programmable, democratized and more mature. The best example of this new web is Wikipedia, but also flickr, del.icio.us, blogs, ... Users become “prosumers” in the sens of producers as well as consumers. The technologies of the Web 2.0 are wikis, tagging, folksonomies, syndication, and ajax. Moreover Web2.0 websites provide APIs, making mashups as well as human computation possible.

SOA can use Web 2.0 technologies, such as rich user interfaces, but needs semantics. Therefore Web 2.0 technologies can be used as a means to generate and access the semantic service layer.

3.6.1 Relevant URLs

The Presentation:

- http://kmi.open.ac.uk/projects/soa4all/presentations/tutorials/kom/web20.pdf (or see annex A).

Further information:

- http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html
- http://www.paulgraham.com/web20.html
- http://blogs.sun.com/stern/entry/web_2_0_in_three

3.7 Reasoning in the WSML Family

Barry Bishop (UIBK) described “Reasoning in the WSML Family”. Ontologies (in WSML) capture domain specific knowledge in the form of *concepts* (hierarchy, attributes, instances), *relations*, and *axioms*. All WSML variants share the same conceptual syntax, but vary on the expressiveness of their logical syntax.

The variants of WSML are WSML-Core, WSML-DL, WSML-Flight, WSML-Rule and WSML-Full, which range over the spectrum defined by description logics and logic programming.

WSML-Core stands at the intersection of logic programming and description logics. WSML-DL is decidable, extends WSML-Core by capturing the Description Logic SHIQ(D) and can directly import OWL-DL. WSML-Flight is an extension of WSML-Core, equivalent to Datalog with inequality and (locally) stratified default negation. WSML-Rule extends WSML-Flight with function symbols, unrestricted use of variables (unsafe rules), and unstratified rules. WSML-Full unifies WSML-DL and WSML-rule in a common first order framework, but its semantics are still an open research issue.

WSML2Reasoner is intended as a framework for reasoning with all WSML language variants. The software reasoners used are IRIS (an open source Datalog reasoner), MINS, KAON2 and Pellet.

3.7.1 Relevant URLs

The Presentation:

- http://kmi.open.ac.uk/projects/soa4all/presentations/tutorials/kom/wsml-reasoning.pdf (or see annex A).

4. Conclusions

The tutorials on background technologies given in Madrid on March 25th 2008 to the participants of the project's kick-off meeting were well attended and reached their aim which was to update the participants with knowledge about the technologies used in the project. These technologies were WSMO, SEE, Semantic Spaces, Web 2.0 and WSML variants.

Annex A.

The present annex includes the following presentations (in power point) as mentioned beforehand thought the document, and those are listed by the same order as presented in the Agenda from the Kick-off meeting of the project:

1. WSMO presentation
2. Semantic Execution Environment – SEE
3. Semantic Spaces Tutorial
4. Web 2.0 Tutorial
5. Reasoning with WSML