



Data, Information and Process Integration  
with Semantic Web Services

## **DIP**

*Data, Information and Process Integration with Semantic Web Services*

**FP6 – 507483**

Deliverable

# **WP4: Service Usage D4.3 Publishing Process Development**

Marc Pellmann (inubit AG)

Benjamin Janus (inubit AG)

Joachim Quantz (inubit AG)

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**SUMMARY**

This deliverable covers the development of the publishing process of services in DIP. The Publishing Prototype supports the publishing of Semantic Web Services both via a browser-based GUI and via a Web Service interface.

This deliverable contributes to the exploitable tools developed in DIP.

This deliverable is of relevance to Work Package 6 “Interoperability and Architecture” in general and to the Component API and Architecture deliverables in particular (D6.5 – D6.14).

The publishing prototype should be used by developers of Semantic Web Services who want to publish their services.

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## Document Information

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<b>EU Project officer</b>	Daniele Rizzi		




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<b>Authors (Partner)</b>	Benjamin Janus (inubit), Marc Pellmann (inubit), Joachim Quantz (inubit)		
<b>Responsible Author</b>	Marc Pellmann		<b>Email</b> marc.pellmann@inubit.com
	<b>Partner</b>	inubit AG	<b>Phone</b> +49.30.72 61 12 -132

<b>Abstract (for dissemination)</b>	Process of publish a semantic web service. The service is available as a web service (later semantic), online.
<b>Keywords</b>	Service publishing. Wsmo4j.

## Project Consortium Information

Partner	Acronym	Contact
National University of Ireland Galway	NUIG  National University of Ireland, Galway <i>Ollscoil na hÉireann, Gaillimh</i>	Prof. Dr. Christoph Bussler Digital Enterprise Research Institute (DERI) National University of Ireland, Galway Galway Ireland Email: <a href="mailto:chris.bussler@deri.org">chris.bussler@deri.org</a> Tel: +353 91 512460
Fundacion De La Innovacion.Bankinter	Bankinter 	Monica Martinez Montes Fundacion de la Innovacion. BankInter Paseo Castellana, 29 28046 Madrid, Spain Email: <a href="mailto:mmtnez@bankinter.es">mmtnez@bankinter.es</a> Tel: 916234238
Berlecon Research GmbH	Berlecon 	Dr. Thorsten Wichmann Berlecon Research GmbH Oranienburger Str. 32 10117 Berlin, Germany Email: <a href="mailto:tw@berlecon.de">tw@berlecon.de</a> Tel: +49 30 2852960
British Telecommunications Plc.	BT 	Dr John Davies BT Exact (Orion Floor 5 pp12) Adastral Park Martlesham Ipswich IP5 3RE, United Kingdom Email: <a href="mailto:john.nj.davies@bt.com">john.nj.davies@bt.com</a> Tel: +44 1473 609583
Swiss Federal Institute of Technology, Lausanne	EPFL 	Prof. Karl Aberer Distributed Information Systems Laboratory École Polytechnique Fédérale de Lausanne Bât. PSE-A 1015 Lausanne, Switzerland Email : <a href="mailto:Karl.Aberer@epfl.ch">Karl.Aberer@epfl.ch</a> Tel: +41 21 693 4679
Essex County Council	Essex 	Mary Rowlett, Essex County Council PO Box 11, County Hall, Duke Street Chelmsford, Essex, CM1 1LX United Kingdom. Email: <a href="mailto:maryr@essexcc.gov.uk">maryr@essexcc.gov.uk</a> Tel: +44 (0)1245 436524
Forschungszentrum Informatik	FZI 	Andreas Abecker Forschungszentrum Informatik Haid-und-Neu Strasse 10-14 76131 Karlsruhe Germany Email: <a href="mailto:abecker@fzi.de">abecker@fzi.de</a> Tel: +49 721 9654 0

Partner	Acronym	Contact
Institut für Informatik, Leopold-Franzens Universität Innsbruck	UIBK 	Prof. Dieter Fensel Institute of computer science University of Innsbruck Technikerstr. 25 A-6020 Innsbruck, Austria Email: <a href="mailto:dieter.fensel@deri.org">dieter.fensel@deri.org</a> Tel: +43 512 5076485
ILOG SA	ILOG  Changing the rules of business	Christian de Sainte Marie 9 Rue de Verdun, 94253 Gentilly, France Email: <a href="mailto:csma@ilog.fr">csma@ilog.fr</a> Tel: +33 1 49082981
inubit AG	Inubit  the integration experts	Torsten Schmale inubit AG Lützowstraße 105-106 D-10785 Berlin Germany Email: <a href="mailto:ts@inubit.com">ts@inubit.com</a> Tel: +49 30726112 0
Intelligent Software Components, S.A.	iSOCO 	Dr. V. Richard Benjamins, Director R&D Intelligent Software Components, S.A. Pedro de Valdivia 10 28006 Madrid, Spain Email: <a href="mailto:rbenjamins@isoco.com">rbenjamins@isoco.com</a> Tel. +34 913 349 797
NIWA WEB Solutions	NIWA 	Alexander Wahler NIWA WEB Solutions Niederacher & Wahler OEG Kirchengasse 13/1a A-1070 Wien Email: <a href="mailto:wahler@niwa.at">wahler@niwa.at</a> Tel:+43(0)1 3195843-11
The Open University	OU  The Open University	Dr. John Domingue Knowledge Media Institute The Open University, Walton Hall Milton Keynes, MK7 6AA United Kingdom Email: <a href="mailto:j.b.domingue@open.ac.uk">j.b.domingue@open.ac.uk</a> Tel.: +44 1908 655014
SAP AG	SAP 	Dr. Elmar Dorner SAP Research, CEC Karlsruhe SAP AG Vincenz-Priessnitz-Str. 1 76131 Karlsruhe, Germany Email: <a href="mailto:elmar.dorner@sap.com">elmar.dorner@sap.com</a> Tel: +49 721 6902 31

<p>Sirma AI Ltd.</p>	<p>Sirma</p>  <p><b>Ontotext</b> Knowledge and Language Engineering Lab of Sirma</p>	<p>Atanas Kiryakov, Ontotext Lab, - Sirma AI EAD Office Express IT Centre, 3rd Floor 135 Tzarigradsko Chausse Sofia 1784, Bulgaria Email: <a href="mailto:atanas.kiryakov@sirma.bg">atanas.kiryakov@sirma.bg</a> Tel.: +359 2 9768 303</p>
<p>Unicorn Solution Ltd.</p>	<p>Unicorn</p> 	<p>Jeff Eisenberg Unicorn Solutions Ltd, Malcha Technology Park 1 Jerusalem 96951 Israel Email: <a href="mailto:Jeff.Eisenberg@unicorn.com">Jeff.Eisenberg@unicorn.com</a> Tel.: +972 2 6491111</p>
<p>Vrije Universiteit Brussel</p>	<p>VUB</p>  <p>Vrije Universiteit Brussel</p>	<p>Pieter De Leenheer Starlab- VUB Vrije Universiteit Brussel Pleinlaan 2, G-10 1050 Brussel ,Belgium Email: <a href="mailto:Pieter.De.Leenheer@vub.ac.be">Pieter.De.Leenheer@vub.ac.be</a> Tel.: +32 (0) 2 629 3749</p>

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## 1 INTRODUCTION

This deliverable describes the Publishing Prototype. The specification in D4.2 [1] originally advocated an approach of using a UDDI-style registry for publishing. However, it was later decided that the focus in DIP should primarily be on storing Semantic Web Services in WSMML/WSMO-style data stores (see D6.2 [2]).<sup>1</sup>

The current Publishing Prototype uses wsmo4j as underlying tool for reading and writing the published services in wsml. Existing RDF-stores such as Jena and SESAME have also been experimented with. Whereas Jena did not perform satisfactorily, a version using SESAME is still maintained by inubit.

In principle, it is straightforward to exchange the underlying data store. Once the Ontology Repository (D2.5 [3]) becomes available, the Publishing Prototype will use it as underlying data store.

## 2 FACT SHEET

### 2.1 Deliverable name

Publishing Process Development

### 2.2 Contact person with contact details

Marc Pellmann

marc.pellmann@inubit.com

inubit AG

Lützowstr. 105-106

10785 Berlin

### 2.3 Short description of purpose, scope and functionality

The Publishing Prototype allows the specification of non-functional-properties of WSMO-style Semantic Web Services. These specifications can be entered manually via a browser-based GUI as well as programmatically via a Web Services interface (WSDL).

Currently, the Publishing Prototype supports the operations “publish” for publishing an SWS, “update” for updating information for an SWS already published, and “findInstances” for retrieving published SWS.

### 2.4 Technical requirements for using/installing the prototype

There are two different ways to use the publishing prototype:

1. A browser-based GUI for publishing Semantic Web Services is available at: <http://demo.inubit.com:8888/ibis/servlet/FormServlet?loginPage=dip.html>. This

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<sup>1</sup> The main reason for this decision was that an ontology-based registry is a much more straightforward solution for SWS than a UDDI-style registry. Note that the approach realized in this deliverable is consistent with the approach proposed in D4.2. It will thus be possible to extend the current version with a UDDI-style approach later in the project.

GUI can be accessed with any standard Web Browser (the login name is **dip** and the password is **inubit**). If a firewall is installed, it has to be ensured that port 8888 is accessible.

2. The publishing prototype can also be accessed by making a SOAP call to the WSDL interface (see 2.5).

Internally, the publishing prototype uses the inubit IS 4.0 [4] for the workflows implemented in the browser-based GUI and wsmo4j version 0.3.1. This version of wsmo4j is compliant with the WSMO v.1.2 and WSML 0.2 specifications [5,6].

Since publishing is provided via a Web Service and a browser-based GUI neither the inubit IS nor wsmo4j have to be installed in order to use the publishing prototype.

## 2.5 Detailed information on how to use/evaluate the prototype

The service description includes all information that you need to use the service. The service description (WSDL) provided at:

<http://demo.inubit.com:8888/ibis/services/SWS%20WebService%20Connector?wsdl>

The service itself is accessible at:

<http://demo.inubit.com:8888/ibis/services/SWS%20WebService%20Connector>

In addition, the browser-based GUI available at

<http://demo.inubit.com:8888/ibis/servlet/FormServlet?loginPage=dip.html>.

can be used (the login name is **dip** and the password is **inubit**).

## 3 DOCUMENTATION

### 3.1 Service Interface Documentation

This section lists the operations provided by the Publishing Prototype and their respective parameters. The formal description of the interface is available as a WSDL file at:

<http://demo.inubit.com:8888/ibis/services/SWS%20WebService%20Connector?wsdl>

#### 3.1.1 *findInstances()*

- concept (String): The concept, whose instances are to be searched.
- attribute (String): The name of the attribute that must have a certain value.
- attributeValue (String): The value that must be assigned to the attribute.

```
<findInstances>
  <concept>web-service-non-functional-properties</concept>
  <attribute>language</attribute>
  <attributeValue>german</attributeValue>
</findInstances>
```

#### 3.1.2 *update()*

- instanceName (String): The name of the instance that is to be updated (the class is determined automatically)

- attributes: the **non-functional** attributes of the service
- attributeValues: The attribute 'name' contains the name of the attribute that receives the new values.
  - value (String) - attribute value
  - value (String) - attribute value
  - ...
- Example:

```
<update>
  <instanceName>web-service-2</instanceName>
  <attributes>
    <attributeValues name='language'>
      <value>german</value>
      <value>english</value>
    </attributeValues>
  </attributes>
</update>
```

### 3.1.3 *publish()*

- concept (String): Name of the concept
- instanceName (String): Name of the instance
- attributes: the **non-functional** attributes of the service
- attributeValues: The attribute 'name' contains the name of the attribute that receives the new values.
  - value (String) attribute value
  - value (String) attribute value
  - ...
- Example:

```
<publish>
  <concept>web-service</concept>
  <instanceName>web-service-test</instanceName>
  <attributes>
    <attributeValues name='language'>
      <value>german</value>
      <value>english</value>
    </attributeValues>
    <attributeValues name='creator'>
      <value>bj</value>
    </attributeValues>
  </attributes>
</publish>
```

## 4 DEMONSTRATION INFORMATION

The publishing prototype can best be demonstrated by using the browser-based GUI at:

<http://demo.inubit.com:8888/ibis/servlet/FormServlet?loginPage=dip.html>

The login name is **dip** and the password is **inubit**.

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The GUI is more or less self-explaining.

After login, the user can choose which kind of WSMO entity to publish. The current prototype only supports publishing of Web Services, however. After choosing the Web Service entity, a list of already published service instances is displayed.

The user now has three options:

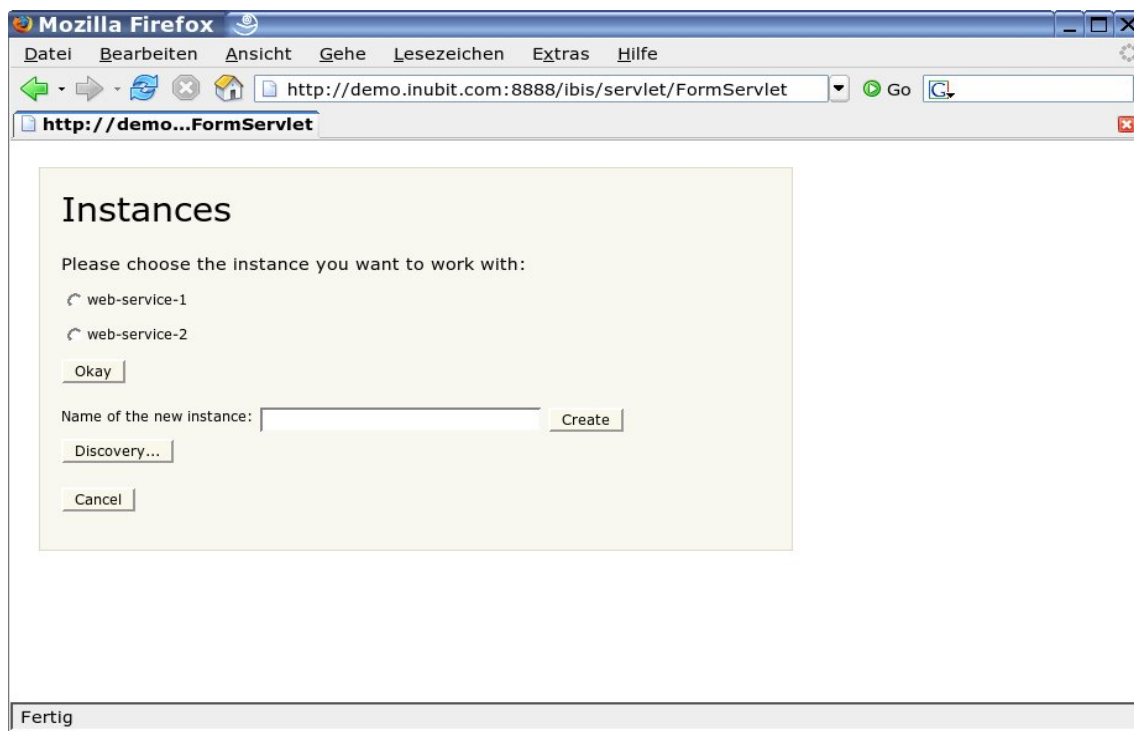
- Updating an already published service by selecting the instance and clicking on “Okay”
- Creating a new service by specifying the service name and clicking “Create”
- Clicking on “Discovery” to search for published services with specific properties.

When choosing a particular service instance, all current values of non-functional-properties attributes are displayed. The user can change the values for these attributes or add new values (using the “+” button). The user can also search for published service instances by specifying attribute values and clicking the “?” button.

In Discovery mode the user can specify values for attributes and choose type-specific operators such as “equal” or “contains” for strings and “=”, “<”, and “>” for floats.

The screenshots below illustrate the functionality of the GUI.

- Selection of an Instance



o Presentation of instance information

**Relations of instance web-service-1**

<input type="text"/>	+ ?	<b>contributor</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>coverage</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>creator</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
Dec 2004	+ ?	<b>date</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>description</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>format</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>identifier</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
german	+ ?	<b>language</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>publisher</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>relation</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>rights</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>source</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>subject</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
Marcus Service	+ ?	<b>title</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>type</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
12.5	+ ?	<b>accuracy</b> ( <a href="http://www.w3.org/2001/XMLSchema#float">http://www.w3.org/2001/XMLSchema#float</a> )
<input type="text"/>	+ ?	<b>financial</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>networkRelationQoS</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>performance</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>reliability</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>robustness</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>scalability</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>security</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>transactional</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
<input type="text"/>	+ ?	<b>trust</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )
V0.1	+ ?	<b>version</b> ( <a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a> )

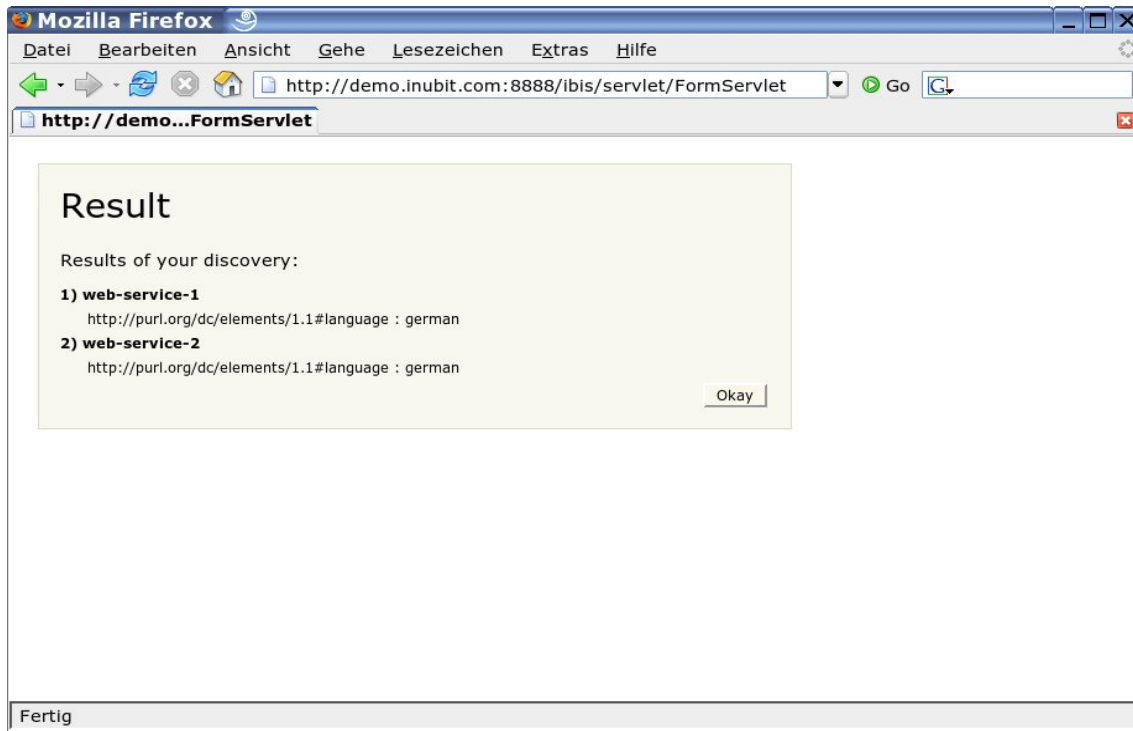
Choose other WSMO-WebService-Entity | Submit changes

Fertig

- Discovery query:

The screenshot shows a web browser window titled "Mozilla Firefox" with the address bar displaying "http://demo.inubit.com:8888/ibis/servlet/FormServlet". The main content area is titled "Discovery mask" and contains a form with 20 rows. Each row consists of an input field, a dropdown menu (mostly set to "equal", with "contains" for language and subject, and "=" for accuracy), and a label with a schema URI. The labels are: contributor, coverage, creator, date, description, format, identifier, language, publisher, relation, rights, source, subject, title, type, accuracy, financial, networkRelationQoS, performance, reliability, robustness, scalability, security, transactional, trust, and version. A "Find" button is located at the bottom left of the form area.

- Presentation of discovery results:



## REFERENCES

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