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ICT-2009-6.4
Information and Communication Technology

Tagging Tool based on a Semantic Discovery Framework

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Version 1.0

TaToo Service Specification Template

Annex of D3.1.2 Semantic Service Environment and Framework Architecture V2

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Document Control Page

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1. Management summary

a) Purpose of this document

This document is both a template and a guide for writing and formatting the functional specifications of TaToo services and is based on the Template for the abstract Specification of ORCHESTRA Interface Types [ORCH-AbstrIfTpl], the Template for the abstract Specification of ORCHESTRA Service Types [ORCH-AbstrSvTpl] and the Template for the implementation Specification of ORCHESTRA Services [ORCH-ImplTpl]. Those three templates were developed during the ORCHESTRA[1] FP6 project. This document is an annex to the TaToo deliverable D3.1.2 - Semantic Service Environment and Framework Architecture V2. No changes to the specification template developed in V1 were necessary for V2.

b) Intended audience

The target readers of this specification template are members of the specification work package of the TaToo project as well as people interested in the specification and development of TaToo services and client tools.

2. Structure of this document

This document consists of two parts:

1. The first part provides information related to the template itself plus general rules and guidelines how a functional specification shall be created.

2. The second part is an outline for a TaToo service specification and provides detailed instructions for the preparation of such.

The specification outline is again divided into five parts:

1. The first part consists of a general description of the context of the service.

2. The second part contains a prose description of the service interfaces and operations plus an optional formal technology independent service specification in UML. Technology independence in the context of a service specification means for example, that there are no assumptions made whether the service implementation is realised with the SOAP Web-Services or REST Web Services technology.

3. The third part contains the mandatory functional service specification.

4. Annex 1: Technology independent model (optional) contains the optional detailed static and dynamic UML diagrams referenced in the second part of the specification.

All chapters that are not explicitly marked as optional are mandatory.

[1] http://www.eu-orchestra.org/

c) Conventions used in this document

To assure a consistent layout of the specifications we have adopted the notation rules provided by Open Geospatial Consortium (OGC). The following text passage has been copied from the OGC implementation template [OGC-Impl-Template]:

"*Most text displayed in Black is mandatory and must be provided in every document as is. That text has the font colour "Auto". Just fill in the "blanks". The Red text is also mandatory but must be modified to reflect proper usage and content. For example, the Black text for Date is followed by red text showing the proper format for entering the date. Please make sure that after replacing the red text that the font colour is set to "Auto" (displayed and printed in black). Text coloured in red is a placeholder for a special data and is to replace with the correspondent such (e.g. the service name, a date, …).*"

Text coloured in green is a description of the designated content and may not appear in the resulting specification but shall be replaced with the requested information when applicable.

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3. Guidelines and rules

3.1. Naming conventions

The following naming conventions are based on the "*Code Conventions for the Java™ Programming Language*" by Sun. They have been adapted to comply with requirements of a TaToo service specification.

Naming conventions make service specifications more understandable. They can also give information about the behaviour of an operation, which can be helpful in understanding the service specification. For example the prefixes "get", "update" and "delete" shall indicate whether an operation retrieves, manipulates or deletes data.

- Class name
  Class names should be nouns with the first letter of each word capitalized. Try to keep your class names simple and descriptive. Acronyms and abbreviations should be avoided, unless the abbreviation is the common form, such as URL or HTML. If "meta information" is part of such a name use "MetaInformation".

- Interface name
  Interface names should be capitalized like class names.

- Operation name
  Operation names should start with a verb, each following word should start with an uppercase letter. The choice of an operation name should be mnemonic - that is, designed to indicate to the casual observer the intent of its use. The following rules shall be applied to all access-operations:
  - use a getXXX operation to express the read access to (feature) attributes
  - use a setXXX operation to express the write access to (feature) attributes
  - use a createXXX to express the creation of a (feature or object) instance
  - use a deleteXXX to express the deletion of a (feature or object) instance
  - use an addXXX to express the addition of a (feature or object) instance to a list
  - use a removeXXX to express the removal of a (feature or object) instance from a list

  Parameter names are treated like variables (see below).

- Variable name
  Variable names start with a lowercase letter; names should not start with an underscore "_" or dollar sign "$". Variable names should be short yet meaningful.

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3.2. Diagram formatting

To ensure a consist look of all service specifications, it is necessary to define the following simple rules for the formatting of UML diagrams:

- The background colour of a diagram (page) shall be White
- The background of an element (class, …) shall be White
- The foreground colour of an element shall be Black.
- The text colour shall be Black.

3.3. References

ORCH-ImplTpl Template for the implementation Specification of ORCHESTRA Services, ORCHESTRA Consortium, Editor: Pascal Dihé, Environmental Informatics Group (EIG), published 07/02/2008, http://www.enviromatics.net/projects/orchestra/Service_Implementation_Specification_Template.pdf

ORCH-AbstrIfTpl Template for the abstract Specification of ORCHESTRA Interface Types, ORCHESTRA Consortium, Editor: Pascal Dihé, Environmental Informatics Group (EIG), published 07/02/2008, http://www.enviromatics.net/projects/orchestra/Abstract_Interface_Specification_Template.pdf

ORCH-AbstrSvTpl Template for the abstract Specification of ORCHESTRA Service Types, ORCHESTRA Consortium, Editor: Pascal Dihé, Environmental Informatics Group (EIG), published 07/02/2008, http://www.enviromatics.net/projects/orchestra/Abstract_Service_Specification_Template.pdf

OGC-Impl-Template Open Geospatial Consortium Doc. No. 05-009r2, OpenGIS® Template for OWS Implementation Specifications, http://portal.opengeospatial.org/files/?artifact_id=11092

SOA-RA, 2008 OASIS Reference Architecture for Service Oriented Architecture Version 1.0 Public Review Draft 1, 23 April 2008, http://docs.oasis-open.org/soa-rm/soa-ra/v1.0/soa-ra-pr-01.pdf

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---------- **The specification starts here** ----------

Please remember to remove all preceding pages and to replace or delete the Green and Red text.

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TaToo Service Specification Template

This is a reference of the document property 'title'. Please change the title of document property and do not directly change the text in the document. To refresh all references press STRG+A and F9.

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4. Management summary

4.1. Purpose of this document

This document is a functional specification of the XXX service and is based on the Template for the Specification of TaToo Service version 1.0. It replaces/updates/refines/… the specification version x.x. A replacement/update/refinement/… of chapters was required due to …. A few words about changes and updates to the last revision of this document shall be provided.

Improvements in this document are desirable to …. Describe what is planned in the next version of the specification or any limitations of the current specification that should be resolved in the future.

4.2. Intended audience

The target readers of this specification are members of the implementation work package of the TaToo project as well as people interested in the development of TaToo services and client tools.

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5. Conventions

5.1. Abbreviations and acronyms

Enter in the table below the abbreviations and acronyms used in this specification.

5.2. Terms and definitions

Shall include a list of terms and definitions that are not already defined in the common TaToo glossary.

Terms and definitions necessary for understanding this document are defined in the common TaToo glossary, except for the following terms.

- Term name
  Definition

5.3. UML Notation

All diagrams that appear in this specification are presented using the Unified Modelling Language (UML) version 2.0 as the conceptual schema language.

5.4. Used parts of other documents (optional)

If significant parts of other documents are copied into this document, those parts can be highlighted with a grey background, and this chapter can be included to indicate that this marking is used.

This document uses significant parts of document XXX. To reduce the need to refer to that document, this document copies some of those parts with small modifications. To indicate those parts to readers of this document, the largely copied parts are shown with a light grey background.

6. Overview and outline

The intention of this chapter is to provide a brief overview on the service's subject, capabilities and architecture without going to much into details. This overview per se is in general not sufficient for the implementation of the service, but it shall provide an interested reader with a short and precise description of the service without the need to read the whole service specification document.

6.1. Role and scope of the Service

Starts with a description of the service and shall be on a level of detail which makes sure to fully understand the role and behaviour of the service. In addition to that it should be discussed what is within and beyond the scope of this service, e.g. by indicating the limits of applicability of this service.

6.2. Service Specification summary

This chapter shall give a quick overview on all specified interfaces and their operations of the discussed service.

Note: If the service inherits an interface from another service specification the name of this service shall be indicated in brackets in the interface name.

This service specification of the XXX Service is comprised of following interfaces:

- …
- …

In addition to the above text this chapter should provide a class diagram of the service including the operations of its interfaces.

7. Context

In this chapter, the relations of this specification to TaToo technical requirements, international standards and other related (TaToo) service specifications and information models shall be explicated.

7.1. Relation to technical requirements

Please describe which technical requirements are addressed by this specification and to which degree they are fulfilled in the current specification. You should also list implementation / technological requirements that are not considered on specification level (e.g. encryption of communication channels).

The XXX Service addresses the following technical requirements as specified in D2.3.2 – Requirements Document (TaToo - D322, 2011).

Requirements ID and Name	Scope	Fulfilment
TR.CATEGORY.NNN	S/I	…
…		…

- Requirements ID
  The unique id of the requirement as defined in D2.3.1.
- Scope
  Scope of the requirement: Specification or Implementation
- Fulfilment
  Describe how and to which degree the requirement is fulfilled.

7.2. Relations to standards

An overview about related standards and how this service will make use of them. References to standard specifications and, if appropriate, a very short description of relevant standards in the context of this service should be included.

Please describe also as precise but as short as possible for all standard references provided in this section which elements of the standard have been used and whether and why there is a deviation from this standard necessary.

This section should give answers to the following questions:

- What are the standards are available? Description of type (de facto, de jure, …), maturity, adaptability, etc.
- How can these standards be adopted?
- Are there any modifications of existing standards necessary? Why?
- What are the consequences if there are no standards available?

If no information about standards can be provided, use one of the following sentences:

The XXX Service does not have any relations to standards. No standard could be found that is applicable to the specification of the XXX Service.

7.3. Relations to other TaToo Service Specifications

A brief overview on possible dependencies of this service on other TaToo Services and how interaction with these services could take place. This is especially interesting for TaToo Services using or depending on non-TaToo Services in order to achieve certain functionality.

7.4. Relations to information models

Any relation to information models specified outside this document should be mentioned here. Especially if the service has a rather generic interface where the specification of concrete parameters depends on a certain use case.

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8. Specification of the XXX interface

In the subsequent chapters, the interfaces of the service shall be described in prose and optionally in UML. For each distinct interface the service offers, a new chapter shall be introduced.

In addition to the textual description this chapter may provide a class diagram of the interface and shall provide a table that summarise the operations of the interface.

The XXX interface of the XXX Service defines the following operations:

Operation Name	Description
…	…

Table 1: Summary of Operations

- Operation Name
  The name of the Service Operation without any return-, parameter- or exception types

- Description
  A very brief description of the operation

The optional formal technology independent specification of this interface in UML can be found in Annex 1: Technology independent model (optional). If no optional UML model is provided, the foregoing statement shall be deleted.

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8.1. Specification of the XXX operation

The textual description of the operation should enable a service developer to understand the intended behaviour of the operation. The following table is intended to give a short overview about the request types, response types and exceptions.

A request to perform the XXX operation shall include the parameters listed and defined in the table below. This table also specifies the data type (Type), the obligation [optional|mandatory] (Use) and a short description (Description) of each listed parameter. Furthermore the "Description" shall state the consequences for service instances if the correspondent parameter is optional and omitted.

The mandatory / optional XXX operation does …

A detailed textual description of the operation shall be provided.

In addition the signature of the operation shall be provided in the following form:

The signatures of the operation is

<return type> / void <operation name>(<parameter types>) throws <exception types>

- return type: return type or void
- operation name: name of the operation
- parameter types: 0…n parameter types, separated by comma
- exception types: . 2…n exception types, separated by comma

Overrides	<name of parent interface and overridden operation> / not applicable			
Preconditions	<preconditions of this operation> / none			
Post conditions	<post conditions of this operation> / none			
Use	mandatory / optional			
Receives	**Name**	**Type**	**Use**	**Description**
	<parameter name>	<data type>	<mandatory | optional>	<e.g. range>
Returns	**Type**		**Description**	
	<data type>		<short description>	
Throws	**Type**		**Cause**	

	<exception type>	<comments>

Table 2: Specification of the XXX Operation

- Overrides
  Name of the parent interface and overridden operation. The format should be interface::operation
- Preconditions / Postconditions
  describes the required state of the internal status of the service before and after the invocation of the operation. This does not include assumptions about parameters like "parameter x is of type y", "parameter x is well-formed", etc.
- Use
  describe if this operation is optional or mandatory
- Receives
  list of input parameters or reference to an information model / application schema.
  - Name
    Name of the parameter
  - Type
    Data Type (if applicable).
  - Use
    required or optional
    Note the behaviour of the operation in case of missing required and optional parameters should be described in the detailed textual description above.
  - Description
    short description of the parameter (how the parameter is used), e.g. expected values, etc.
- Returns
  Type of return parameter, or void
- Throws
  List of exceptions thrown by this method (if applicable
  - Cause
    What caused this exception?

Note: Read and write access is determined by the prefixes get and set.

9. Specification of the YYY interface (optional)

For each dedicated interface a new chapter shall be introduced.

Note: If the service inherits an interface from another service specification and no changes are made to the original interface, it is not necessary to introduce a new chapter for the inherited interface.

10. Acknowledgements

"The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under Grant Agreement Number 247893."

11. References

TaToo-D232, 2011 Božić B., Schimak G.: Requirements document – V2, Deliverable 2.3.2 of TaToo Project, Public Document, 2011.

12. Annex 1: Technology independent model (optional)

12.1. Static UML model

The static model may contain a detailed class diagram visualising all interfaces, operations and parameters and the UML specifications of the information models.

12.2. Dynamic UML model

The dynamic model describes the suggested behaviour of the service operations (e.g. order of invocation) and may contain communication diagrams (less detail) and if necessary sequence diagrams (more detail).

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