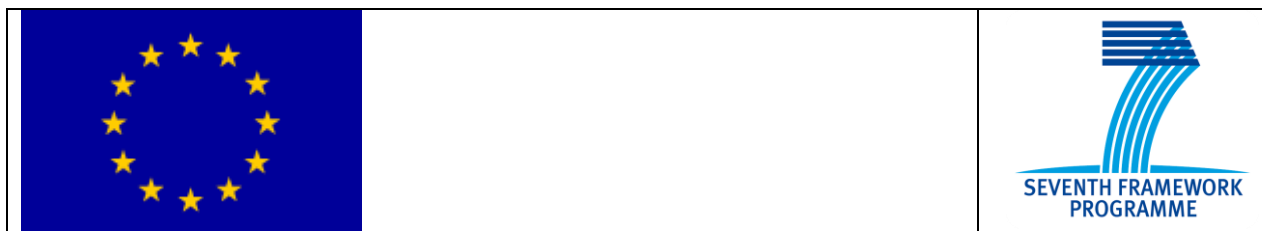


**Seventh Framework Programme
ICT-2009-6.4
Information and Communication Technology**



**Tagging Tool based on a Semantic Discovery
Framework**



Project ID: 247893

Deliverable D3.1.3a

Version 1.1.1

TaToo Service Specification Template V3

Annex of D3.1.3 Semantic Service Environment and Framework Architecture V3

Document Control Page

Title	Service Specification Template	
Creator	cismet GmbH (CIS)	
Editor	Pascal Dihé	
Description	This is a Template for the functional Specification of TaToo Services.	
Publisher	TaToo Consortium	
Contributors	Sascha Schlobinski (CIS); Avellino Giuseppe, Petronzio Luca (ED); Tomas Pariente Lobo, Jose Maria Fuentes Lopez (ATOS); Andrea-Emilio Rizzoli (IDSIA); Bojan Božić, Gerald Schimak (AIT)	
Type	Text	
Format	MS Word	
Language	EN-GB	
Creation date	22.03.2010	
Version number	1.1.1	
Version date	01.06.2012	
Last modified by	Pascal Dihé	
Rights	Copyright "TaToo Consortium". During the drafting process, access is generally limited to the TaToo Partners.	
Audience	<input type="checkbox"/> internal <input checked="" type="checkbox"/> public <input type="checkbox"/> restricted, access granted to:	
Review status	<input type="checkbox"/> Draft <input checked="" type="checkbox"/> WP Leader accepted <input type="checkbox"/> PCO quality controlled <input type="checkbox"/> Co-ordinator accepted	Where applicable: <input type="checkbox"/> Accepted by the GA <input type="checkbox"/> Accepted by the GA as public document
Action requested	<input type="checkbox"/> to be revised by Partners involved in the preparation of the Project Deliverable <input type="checkbox"/> to be revised by all TaToo Partners <input type="checkbox"/> for approval of the WP Leader <input checked="" type="checkbox"/> for approval of the PCO (Quality Manager) <input checked="" type="checkbox"/> for approval of the Project Co-ordinator <input type="checkbox"/> for approval of the General Assembly	
Requested deadline	08/06/2012	

Revision history

Version	Date	Modified by	Comments
0.1	22/03/2010	PDi	1 st draft version
0.2	30/03/2010	PDi	...
0.3	05/04/2010	PDi	Some updates
0.4	06/05/2010	PDi	+ service specification platform & requirements
0.5	13/08/2010	PDi	- implementation / technology specific details
0.5.1	13/09/2010	GSc	QA by PMO
1.0	15/06/2011	PDi	Update for V2
1.0	08/08/2011	GSc	QA
1.1	02/04/2012	PDi	Update for V3
1.1.1	01/06/2012	PDi	Final version for QA



Copyright © 2012, TaToo Consortium

The TaToo Consortium (www.tatoo-project.eu) grants third parties the right to use and distribute all or parts of this document, provided that the TaToo project and the document are properly referenced.

THIS DOCUMENT IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS DOCUMENT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Table of Contents

1. Management summary	6
a) Purpose of this document	6
b) Intended audience	6
2. Structure of this document	6
c) Conventions used in this document	7
3. Guidelines and rules	8
3.1. Naming conventions.....	8
3.2. Diagram formatting.....	9
3.3. References.....	9
4. Management summary	15
4.1. Purpose of this document.....	15
4.2. Intended audience.....	15
5. Conventions	16
5.1. Abbreviations and acronyms	16
5.2. Terms and definitions	16
5.3. UML Notation	16
5.4. Used parts of other documents (optional)	16
6. Overview and outline	17
6.1. Role and scope of the Service	17
6.2. Service Specification summary	17
7. Context	18
7.1. Relation to technical requirements	18
7.2. Relations to standards.....	18
7.3. Relations to other TaToo Service Specifications.....	19
7.4. Relations to information models	19
8. Specification of the XXX interface	20
8.1. Specification of the XXX operation.....	21
9. Specification of the YYY interface (optional)	23
10. Acknowledgements	24
11. References	24
12. Annex 1: Technology independent model (optional)	25
12.1. Static UML model	25
12.2. Dynamic UML model	25

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 ORCHESTRA¹ FP6 project. This document is an annex to the TaToo deliverable D3.1.3 - Semantic Service Environment and Framework Architecture V3. No changes to the specification template developed in V1 were necessary for V3.

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.

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 listParameter 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.

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:

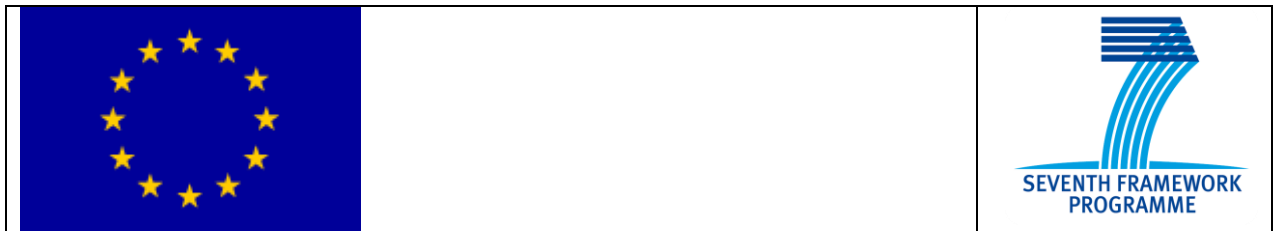
- The background colour of a diagram (page) shall be White
- The background of an element (class, ...) shall be White
- The foreground colour of an element shall be Black.
- The text colour shall be Black.

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>>

----- **The specification starts here** -----
Please remember to remove all preceding pages and to replace or delete the Green and Red text.

Seventh Framework Programme ICT-2009-6.4 Information and Communication Technology



Tagging Tool based on a Semantic Discovery Framework



Project ID: 247893

Deliverable D3.1.3

TaToo Service Specification Template V3

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.

Revision [x.x / 1.1.1]
[Revision number of the
specification] / [Revision
number of the template on
which this specification is
based]

Document Control Page		
Title	TaToo Service Specification Template V3	
Creator	Last name, First name name of organisation	
Editor	Last name, First name name of organisation	
Description	This document defines an abstract and platform independent formal specification of the XXX Service.	
Publisher	TaToo Consortium	
Contributors	all	
Type	Text	
Format	MS Word	
Language	EN-GB	
Creation date	22.03.2010	
Version number	0.1 / 1.1.1	
Version date	26.03.2010	
Last modified by	Last name, First name name of organisation	
Rights	Copyright "TaToo Consortium". During the drafting process, access is generally limited to the TaToo Partners.	
Audience	<input type="checkbox"/> internal <input checked="" type="checkbox"/> public <input type="checkbox"/> restricted, access granted to:	
Review status	<input checked="" type="checkbox"/> Draft <input type="checkbox"/> WP Leader accepted <input type="checkbox"/> PCO quality controlled <input type="checkbox"/> Co-ordinator accepted	Where applicable: <input type="checkbox"/> Accepted by the GA <input type="checkbox"/> Accepted by the GA as public document
Action requested	<input checked="" type="checkbox"/> to be revised by Partners involved in the preparation of the Project Deliverable <input type="checkbox"/> to be revised by all TaToo Partners <input type="checkbox"/> for approval of the WP Leader <input type="checkbox"/> for approval of the PCO (Quality Manager) <input type="checkbox"/> for approval of the Project Co-ordinator <input type="checkbox"/> for approval of the General Assembly	
Requested deadline		

Revision history

Version	Date	Modified by	Comments



Copyright © 2012, TaToo Consortium

The TaToo Consortium (www.tatoo-project.eu) grants third parties the right to use and distribute all or parts of this document, provided that the TaToo project and the document are properly referenced.

THIS DOCUMENT IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS DOCUMENT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Table of Contents

1. Management summary	6
a) Purpose of this document	6
b) Intended audience	6
2. Structure of this document	6
c) Conventions used in this document	7
3. Guidelines and rules	8
3.1. Naming conventions.....	8
3.2. Diagram formatting.....	9
3.3. References.....	9
4. Management summary	15
4.1. Purpose of this document.....	15
4.2. Intended audience.....	15
5. Conventions	16
5.1. Abbreviations and acronyms	16
5.2. Terms and definitions	16
5.3. UML Notation	16
5.4. Used parts of other documents (optional)	16
6. Overview and outline	17
6.1. Role and scope of the Service	17
6.2. Service Specification summary	17
7. Context	18
7.1. Relation to technical requirements	18
7.2. Relations to standards.....	18
7.3. Relations to other TaToo Service Specifications	19
7.4. Relations to information models	19
8. Specification of the XXX interface	20
8.1. Specification of the XXX operation	21
9. Specification of the YYY interface (optional)	23
10. Acknowledgements	24
11. References	24
12. Annex 1: Technology independent model (optional)	25
12.1. Static UML model	25
12.2. Dynamic UML model	25

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.

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 D2.3.1 – “Requirements Document”.

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.

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.

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

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).