

Title: A5.2-D2 [2.4] Context Service Component Specification

<b>Title:</b>
A5.2-D2 [2.4] Context Service Component Specification
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Architecture Team/WP05
<b>References:</b>
A5.2-D2 Framework Prototype Specification
A5.2-D2 [2.1] HUMBOLDT Commons Specification
PA User story: Planning and management of a protected area.
PA User story: Tourism valorisation
User Involvement Document – Third Version

<b>Short Description:</b>
<p>This document describes the specification of the Context Service as part of the HUMBOLDT software framework. For an overview of the entire framework v2.0 description, please refer to the main specification document A5.2-D2. Context Service component specification follows the RM-ODP (ISO 10476), and is aimed at providing information on the responsibilities and collaborations with other components of the service component described herein.</p> <p>The Context Service is a service component that provides context and user management for HUMBOLDT end users. It will also provide management of harmonisation and business constraints definition.</p>
<b>Keywords:</b>
Framework specification, logical architecture, physical architecture, requirements, use cases, context service, user management.

<b>History:</b>			
Version	Author(s)	Status	Comment
001	Ana Belén Antón	new	Initial draft of the document V2.0... structure of the document and initial draft of the Enterprise Viewpoint
002	Ana Belén Antón	rfc	Improvement of the Enterprise Viewpoint. Scenario integration and requirements are reviewed.
003	Ana Belén Antón	rfc	Computational and Information Viewpoint updated.

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004	Ana Belén Antón	rfc	Text updated after Daniel Fitzner revision. More explanations and examples given where they were required.
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# 1 Introduction

## 1.1. Purpose of this document

This document describes the specification of the Context Service, a component of the HUMBOLDT Framework (as such part of Deliverable A5.2-D2). This document also contains information on the internal data models and message structures used by this service component (Deliverable A5.3-D2).

The Context Service is a service component that provides context and user management/preferences information for HUMBOLDT end users. It will also provide management of harmonisation and business constraints definition.

## 1.2. Abbreviations and Definitions used in this document

This section summarizes all abbreviations used and the valid definitions within the description of the Context Service component.

<b>Abbrev.</b>	<b>Name</b>	<b>Definition</b>
ASP	Application-Specific Product	It refers to a product designed for a specific domain or scenario. For example, in the User Story "Planning and management of a protected area" the ASP is a web portal where all geo-information of a concrete regional park in Italy is sharable with various external administration and decision levels, also this information is provided to people working in the park and citizens. Each of them access to the information with different purposes.
CS	Context Service	Service component of the HUMBOLDT Framework in charge of the management and provision of the specific contexts. This component consists of two modules: the Context Management Service and the User Management Service.
CMS	Context Management Service	Service offered by the Context Service Component to provide basic and derived context information. It is enriching OGC-standards interfaces with specific harmonisation requirements which define the final product.
DQME	Data Quality Measurement and Evaluation	Service component of the HUMBOLDT Framework in charge of the measurement and evaluation of the data quality.
PA	Protected Areas	One of the scenarios defined in HUMBOLDT.
UMS	User Management Service	Service offered by the Context Service Component to offer user management capability and control over a whole set of attributes for each user. Contexts will be available depending on these

<b>Abbrev.</b>	<b>Name</b>	<b>Definition</b>
		attributes. It means that if a user is member of one organization and a specific context has been designed for this organization, the context will be available for him. Furthermore contexts will be matched with user groups but also with individual users.
USP	Unique Selling Proposition	It refers to any aspect of an object that differentiates it from similar objects.

**Table 1: Abbreviations used in this document**

<b>Concept</b>	<b>Definitions</b>
Context	A Context is defined as the specific user requirements related to the environment in which his/her business operates when they are retrieving geo-information.
Service Oriented Architecture (SOA)	Service Oriented Architecture is an architectural and organizational paradigm for organizing and utilizing distributed processing and storing capabilities that may be under the control of different ownership domains by defining loosely-coupled relationships between producers and consumers.
WSDL	The Web Services Description Language (WSDL) is an XML-based language that provides a model for describing Web services. A client program connecting to a web service can read the WSDL to determine what functions are available on the server. Any special datatypes used are embedded in the WSDL file in the form of XML Schema. The client can then use SOAP to actually call one of the functions listed in the WSDL.

**Table 2: Definitions of terms used in this document**

## 1.3. Standards used in this document

In this section, standards specific to the Context Service are listed and described shortly and why they are used.

### 1.3.1 OGC Web Map Context (OGC 05-005)

A Context document includes information about the server(s) providing layer(s) in the overall map, the bounding box and map projection shared by all the maps, sufficient operational metadata for Client software to reproduce the map, and ancillary metadata used to annotate or describe the maps and their provenance for the benefit of human viewers.

There are several possible uses for Context documents:

- The Context document can provide default startup views for particular classes of user. Such a document would have a long lifetime and public accessibility.

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- The Context document can save the state of a viewer client as the user navigates and modifies map layers.
- The Context document can store not only the current settings but also additional information about each layer (e.g., available styles, formats, SRS, etc.) to avoid having to query the map server again once the user has selected a layer.
- The Context document could be saved from one client session and transferred to a different client application to start up with the same context.

Contexts could be catalogued and discovered, thus providing a level of granularity broader than individual layers.

This component provides to a client a GetWebMapContext operation.

### **1.3.2 W3C Web Service**

A Web service is defined by the W3C as "a software system designed to support interoperable Machine to Machine interaction over a network." Web services are frequently just Web APIs that can be accessed over a network, such as the Internet, and executed on a remote system hosting the requested services.<sup>3</sup>

The implementation of the ContextService as a Web service simplifies the development of client software, because it is based on a standardized SOAP protocol. This also enables a simple integrating of the ContextService in a distributed system.

## 2 Enterprise viewpoint

The Context Service is a service component that provides context and user management for HUMBOLDT end users. It will also provide management of harmonisation and business constraints definition.

On one hand, the Context Service manages user/organisation profiles and their harmonisation requirements (constraints). On the other hand, when an end user, who is using a GIS client, requests geodata, the Context Service provides the context information (the constraints which were imposed by the user) to the component/s in charge of manage the geodata transformation process. Therefore the Context Service is enriching the standard interfaces with harmonisation requirements without having to change any of the existing interfaces.

### 2.1. Actors in this component

#### 2.1.1 End Users

The HUMBOLDT End-users consist of a large group who want to solve a problem and decide to use geospatial data for their applications / purposes –they are not interested in the harmonization process itself but only in its results (refer to User Involvement Document – Third Version).

Two further subgroups can be distinguished within this user role: *End-users of geodata*, who are directly working geographical data itself –harmonized or not or integration at all- and *End-users of spatial information*, who use geodata indirectly –using navigation systems, online routing services, etc. An example of the first group would be *GIS experts* and of the second one *decision makers, citizens...*

Both of two subgroups are main users in the Context Service. They need this service to use the common context defined by data custodians and data integrators or to re-define it according to their **user specific constraints** (e.g. bounding box coordinates and map projection of displayed map) or organizations constraints. Therefore they will be able to retrieve the geoinformation in compliance with their specific harmonization requirements.

#### 2.1.2 Data Custodians

HUMBOLDT Data Custodians are people or institutions who are offering data which have been adapted to given standards (harmonized) because of legal or market requirements. They provide data and have the responsibility to do so in a format that may be different from the one they normally use. They are mainly data providers (refer to User Involvement Document – Third Version). Examples of this group are the *national INSPIRE-responsible bodies, territorial governments in charge, mapping agencies...*

Data Custodians use the Context Service to define and serve **generic contexts** according their generic data harmonization requirements keeping in mind the target of the data they are responsible for. It means the domain where the data they are providing is going to be used. One example could be to define the Resolution Constraint which defines the best resolution of the harmonized map in the area where the territorial government is responsible. Other one would be to define the Quality Constraint of the data provided in order to be analyzed with the help of other HUMBOLDT service –the DQME (Data Quality Measurement and Evaluation).

### 2.1.3 Data Integrators

HUMBOLDT Data Integrators are people who have to use heterogeneous geodata to meet the requirements of their daily job (e.g. integration of data for complex analysis). They need data themselves and access this from different facilities potentially in different formats. They have to combine various data sources, harmonize them to make use of them for their own purposes. They are mainly service providers (refer to User Involvement Document – Third Version). Some examples of this group are *planners and officers, but also researchers*.

Data Integrators use the Context Service for defining the **common context** for the group of end users which are going to use the service which they are providing. This is the product definition. For example, officials doing the planning of routes to be made accessible and to be marketed for tourists based on a full set of data ranging from available paths to hydrology and habitats information; they are offering a service to citizens integrating heterogeneous geodata -service which has to be defined with a default context. Other situation would be planners making municipal plans; again they have to define a final product to be reviewed by decision makers.

## 2.2. Business process overview

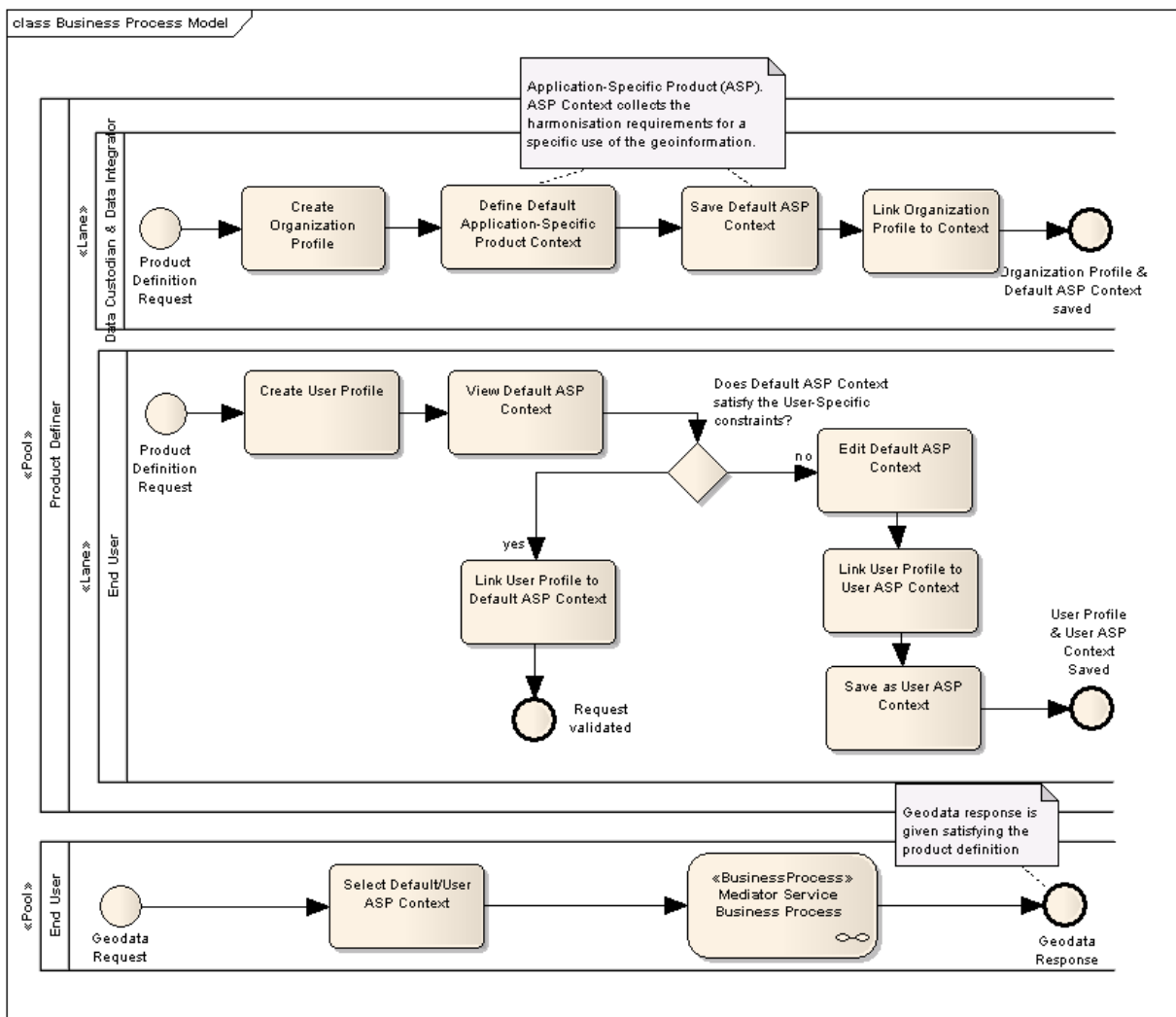
This section gives an overview of the general business processes involving the Context Service component and also its *unique selling proposition (USP)*.

The Context Service makes the use of standard WMS/WFS/WCS clients for geodata harmonization compliant with their requirements. It enables the Mediator Service offers OGC-standard interfaces enriched with specific harmonization requirements without having to change any of these existing interfaces. It provides the capabilities offered by the Web Map Context Documents not just for WMS (WMC, as it is known, was primarily designed only for WMS bindings) but also for WFS, WCS...

From the non-technical capabilities, other of its USPs is to enable the definition and distribution/use of the final product (geodata information such a map but also enriched with text, diagrams, any kind of analysis for better reporting, etc) by different user profiles according their own needs: *language, spatial constraint, style, format, national classifications...*These needs are reflected into their specific Context. In this way, Data Custodians and Data Integrators are able to prepare the data for their stakeholders.

Therefore and for clarifying, the Context Service is in charge of the Product Definition but the offering of this product based on actually available data sets is done by the Mediator Service.

Moreover, for accomplishing this Context Service goal is necessary to additionally offer user management capabilities and to enable users to have control over their attributes for linking contexts to user profiles easily (see more details on that in section 2.3).



**Figure 1: Context Service Business Process**

The business process depicted in the above figure shows two main activities. The first one is focused on *Product Definition* and the second one on *Data Retrieval*:

**1. Product Definition:** This is the main purpose of this service. It consists of defining the user preferences (requirements) when geo information is requested. Data Custodians or Data Integrators should define Default Contexts for specific domains' or scenarios' users when they are publishing harmonized geodata. Therefore the named *Default Context* means the common requirements for possible stakeholders according to their organization profile or domain profile; it also includes the conceptual schema to be used in its application domain. The organization profile should be linked to a specific *Default Context*, which will be able to be re-defined by end users according to their specific constraints. So they can use either *Default Context* pre-defined by Data Custodians/Data Integrators for them or their own *User Contexts*.

**2. Data retrieval:** This activity is mainly supported by the Mediator Service but the Context Service is also needed for its goal. The user requests geodata via a standardized OGC interface such WMS or WFS. This interface is exposed by the Mediator Service using a context identifier provided by the Context Service, which delivers more information on the user requirements than just those included in the request. This context gives to the Mediator Service the constraints which will define the necessary fusion, transformation and encoding processes.

## 2.3. Scenario Integration

All HUMBOLDT scenarios: Border security, Urban planning, Forest, Protected areas, Water, Ocean, Galileo, EriskA and the new ones, require context information whenever the HUMBOLDT system is accessed; whenever data need to be sent to the user. More in general, context and user preferences information are always used to tailor what (and how) is going to be processed and presented. For this reason the CS usage within the scenario is shown in the context of the already described end users scenarios.

Two concrete examples focused on Protected Areas scenario is going to be given in this section: one focused on the Data Integrator's point of view and the other one on the End User's point of view. They are included within the *Planning and management of a protected area* and the *Tourism valorization* User Stories respectively:

### 2.3.1 Planning and management User Story– Preparing geoinformation

*This user story evolves more management and product definition capabilities. Therefore, it is focused on the "Product Definers" (see Figure 1) interactions with the Context Service within the Protected Areas scenario.*

Costanza Bianchi is an architect urban planner with a good experience in GIS. She has the mission of create the development plan of the regional park where she works and guarantee a seamless operational functionality between the park and its communes. In this framework she wants to achieve some final objectives:

- ◆ to create a web access where all geo-information of the park (to be previously assessed and systematised) is sharable, also with the various external administration and decision levels,
- ◆ to make the municipal plans technically compliant with the provisions of the regional government,
- ◆ to create conditions for a good communication towards citizens,
- ◆ to train people working in the park and in the communes to use properly the created tools.

Because of that she is an example of a Data Integrator. She has to use heterogeneous geodata and offer it according to different profiles and, subsequently, needs.

She knows her work is very ambitious and is going to be large and complex because the information which she has to use was created some years ago. It needs to be improved in order to be compliant with current standards and laws. She is going to use a lot of services provided by HUMBOLDT, some of them for defining the mappings between the source models and the target models because the information is going to be exchanged at different administrative levels, others for the actual preparation of the data (off-line harmonisation), etc.

One of her main goals is that the information and the results are available for a long number of stakeholders: regional, provincial, municipal authorities, citizens, people working on the park and also some colleagues in the European Commission experts on planning. That is *to define the product to be offered on the web portal according different user needs*. Because of that she is going to define different DefaultContexts depending on the user profile. She is going to use the Context Service to provide this functionality – joint to the management capability of both users and their access rights to the information.

More specifically, the steps on the product definition are:

1. First of all she creates an organization profile with her organization information. Once the profile is defined, the CS automatically creates a DefaultContext with some basic information given in the Organization Profile. The CS is able to obtain some Constraints as LanguageConstraint, SpatialConstraint or MetadataConstraint from the aforementioned information. It is a primary DefaultContext.
2. Using this DefaultContext as basis, Costanza updates it with the full list of constraints (ThematicConstraint, Resolution Constraint, Temporal Constraint...). She is defining the “organization style” for the outputs to be produced.
3. Furthermore, she should define the QualityConstraint; it is necessary if she wants a measure of spatial data’s relative fitness for her intended purpose.
4. On the other hand, Costanza has previously defined her target model and schema mapping using other HUMBOLDT services (the HUMBOLDT Model Editor and the HUMBOLDT Alignment Editor). Therefore some generic data has been transformed (using the Conceptual Schema Transformer) and it is now available in the protected areas domain model (off-line harmonization), but it is possible some extra data has to be harmonized on-line when a concrete request is done by the end user. So, she can match this conceptual schema with the Context she has just defined.
5. Finally, the common context is saved and matched to her organization. Now, everybody with access rights on Costanza’s organization has access to this defined context.
6. Costanza can also create other contexts linked to her Organization but thinking in concrete kind of users (citizens, workers on the park, decision makers...).
7. The end users of the information prepared by Costanza create their user profile. Again, the CS creates a primary DefaultContext for their, but if they have given their organization profile the Context Service will offer the list of DefaultContexts defined by Costanza. If any of these Contexts doesn’t fit their needs, they will be able to re-define it and save it.

### 2.3.2 Tourism valorisation User Story– Using geoinformation

*This user story is mainly focused on the use of the geospatial information. Therefore, it describes the Context Service functionality when an end user is requesting geo-information within the Protected Areas scenario.*

Mario wants to use the web portal created by Costanza organization for retrieving geoinformation on footpaths, flora endemism, landscape, etc, in his regional park because he is planning to visit the park with his family. He is also validating the effort done by the region to promote tourism exploitation of protected areas.

First of all, Mario accesses to the web portal and requests his user context (created beforehand) by sending the corresponding ContextId because he wants to expand it for satisfying his current Thematic constraints. This updated user context is used when Mario requests the geoinformation on the regional park using standard interfaces, such a WFS request. This will be done by using the Mediator Service, which needs an URL whose host part contains the new context identifier created. As a result the response is received retaining standard compliance and at the same time fulfilling the Mario’s harmonization requirements.

However Mario modifies the output retrieved and as he wants to continue later with the work he saves his work session. The Context Service is able to get the WebMapContext and save it to be retrieved later.

## 2.4. Requirements

This chapter contains both the functional requirements derived from the Scenarios/Use Cases and the non-functional requirements of the HUMBOLDT scenarios and other sources.

For more details on the requirements, please see the HUMBOLDT Requirements Site (<http://humboldt.etra.es/>). Note that the REQ\_ID is given according the available identifiers there. The rationales, acceptance criteria and some comments of the requirements are described in the aforementioned site.

### 2.4.1 Functional Requirements

<b>REQ_ID</b>	<b>Description</b>
REQ_039	The system should enrich the standard interfaces with harmonization requirements without having to change any of the existing interfaces.  Please, note that this requirement is satisfied by the joint capabilities of several HUMBOLDT components, not just the Context Service.
REQ_040	The system should provide the means for saving the user personal style (including maps or reports), both for the working sessions and the outputs to be produced.
REQ_041	The system must provide a central configuration point for individual and organizational harmonisation constraints.
REQ_042	The system must provide a central configuration point for user management and link them to contexts (preferences).
REQ_043	The system should identify the initial user's preferences from the local machine relevant properties and the specific application domain context.
REQ_044	The client application should be able to access the configuration point (see REQ_041 and REQ_042), which can either be local, organization-wide or global.
REQ_045	The system must provide the user with an Identifier/location for his saved context.
REQ_046	The context identifier (see REQ_045) should contain information of the user's context, such as his organization's and level domain.
REQ_047	The system shall maintain a set of configuration parameters to use as defaults for geographical data queries.
REQ_048	The system must provide a context identifier to easily access and display the content, independent of the client application.
REQ_049	The system must be able to create, change and save Contexts.
REQ_050	The system must save and retrieve his work as a Web Map context locally.

**Table 3: Functional Requirements for this component**

### 2.4.2 Non-Functional Requirements

The Context service should fulfill these main non-functional requirements:

REQ_ID	Description
REQ_051	The Context Service must be made available as a Web Service to be used by both client applications and other HUMBOLDT service components.

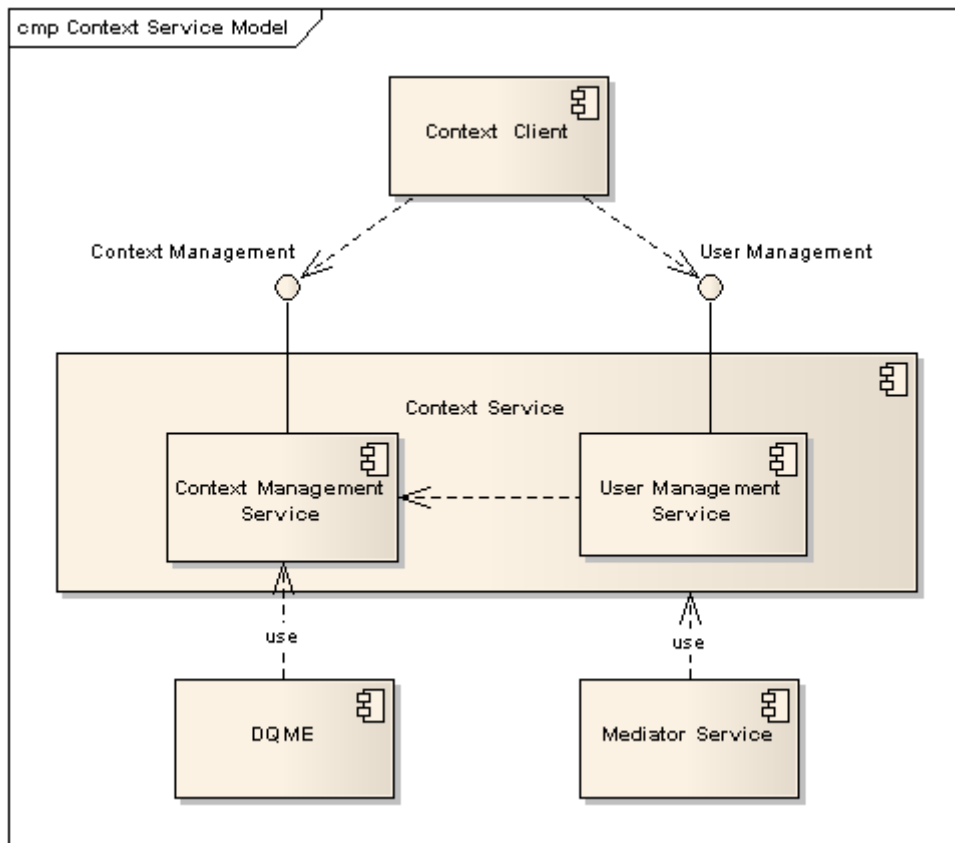
**Table 4: Non-Functional Requirements for this component**

### 3 Computational viewpoint

#### 3.1. Overview

This chapter outlines the logical architecture of the Context Service. It gives an overview of the composition of this service; describing its internal modules, interfaces and interactions with other components.

As described in Figure 2, the Context Service exposes two main interfaces through which a consumer can access its capabilities: to specify harmonization and business constraints -*context management*, and to manage and link contexts with user profiles -*user management*. Because of that, two modules compose the Context Service: the CMS (Context Management Service) and the UMS (User Management Service), which are linked between them in order to provide a specific context to a user profile.



**Figure 2: Component diagram for the Context Service**

The Context Client can be either a Web Frontend (of a web portal where geo-information is provided), or a standard GIS Client allowing user and context configuration. Both of them are offering a dedicated GUI to provide administration services in order to create and edit users and organizations, and also to edit the preferences of these users. The Context Service manages and links this information enriching the OGC standard interfaces.

The Mediator Service retrieves the Context from the Context Service using a context identifier for the transformation process which satisfies the user requirements without having to change any of the existing interfaces.

The DQME also use the Context Service, for retrieving the QualityContext definition. The CS stores the user quality specifications with their thresholds.

## 3.2. Description of the Context Management Service

**Full Name:** Context Service (CS) → Context Management Service (CMS)

### 3.2.1 Responsibilities of the Component/Module

- The component manages contexts, i.e. it allows the creation, modification and removal of a context using its unique identifier. This includes Web Map Context 1.1 documents, which can be created for every managed context.
- The component allows administrators to specify harmonization and business constraints for users who want to use a standard GIS client. It is the product definition.

### 3.2.2 Collaboration

- The Context Client uses the CMS for defining the final product. It means the user preferences or the ASP (application-specific product) of a specific organization or domain.
- The CMS uses the UMS for creating DefaultContexts from the client profile.
- The Mediator Service uses the CMS for retrieving the context using a context identifier.
- The DQME uses the CMS to retrieve the Quality Context.

### 3.2.3 Actions fulfilled by this Component

- To create, edit and remove the Context, which can contain the Default ASP context, user-specific and organization-specific information.
- To create a Default Context from the user/organization profile.
- To link a Conceptual Schema with a Context. It is needed in the case of on-line harmonization. An expert has previously defined a conceptual schema within the application domain and new geo data is required from other sources (data not harmonized), if one Conceptual Schema has been linked to the Context, the Mediator Service could use it for the mapping from the source model to the target model which the Conceptual Schema Transformer will do.
- To link a Context with a user/organization profile in order to set a list of Contexts per user/organization. One user could choice another Context defined by others as own.
- To provide to the Mediator Service the Context using its Unique Context Identifier.
- To provide to the DQME the QualityContext using its Unique Context Identifier.

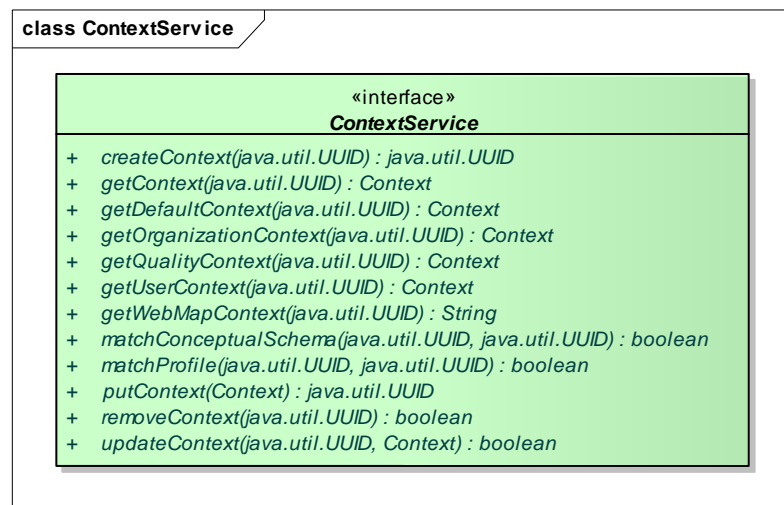
### 3.2.4 Interface overview

The CMS interface provides the following methods/operations that forms the main interfaces exposed by this module as illustrated in Figure 3.

<b>Return</b>	<b>Method/remarks</b>
java.util.UUID	createContext(java.util.UUID profileId)  Creates a Context automatically from a profile definition given through its identifier. It returns the ContextId of the new Context.
Context	getContext(java.util.UUID contextId)  Gets a Context given a unique context identifier. It allows the interface controller access to the context information.
Context	getDefaultContext(java.util.UUID contextId)  Gets the Default Context given its unique identifier. It allows the interface controller access to the default part of the context information.
Context	getOrganizationContext(java.util.UUID contextId)  Gets the Organization Context given its unique identifier. It allows the interface controller access to the organization part of the context information.
Context	getQualityContext(java.util.UUID contextId)  Gets the Quality Context given its unique identifier. It allows the interface controller access to the quality part of the context information.
Context	getUserContext(java.util.UUID contextId)  Gets the User Context given its unique identifier. It allows the interface controller access to the user part of the context information.
String	getWebMapContext(java.util.UUID contextId)  Gets the Web Map Context given its unique identifier. It allows the interface controller access to the WebMapContext part of the context information.
boolean	matchConceptualSchema(java.util.UUID conceptualSchemaId, java.util.UUID contextId)  Matches a conceptual schema with a Context given their respectively unique identifiers. It returns true is the match is successful.
boolean	matchProfile(java.util.UUID profileId, java.util.UUID contextId)  Matches a profile with a Context given their respectively unique identifiers. It returns true is the match is successful.
java.util.UUID	putContext(Context context)  Creates a new context given the context object to be added to the service. It returns the unique identifier assigned to the newly created context.
boolean	removeContext(java.util.UUID contextId)

	Removes an existing context given its unique identifier. It returns true if the delete operation is successful.
boolean	<pre>updateContext ( java.util.UUID contextId, Context newContext )</pre> <p>Updates an existing context given its unique identifier. It returns true if the update operation is successful.</p>

**Table 5: API descriptions of the Context Service.**



**Figure 3: Interface of the Context Management Service.**

### 3.3. Description of the User Management Service

**Full Name:** User Management Service (UMS)

#### 3.3.1 Responsibilities of the Component/Module

- This component handles the configuration for all users and organizations which want to use the data harmonization capabilities that HUMBOLDT offers.
- The component can manage users and organizations, i.e. allow creation, modification and removal of them.

#### 3.3.2 Collaboration

- The Context Client uses the UMS for defining the client profile.
- The UMS is used by the CMS for creating DefaultContexts from the client profile.

### 3.3.3 Actions fulfilled by this Component

- To create, get, update and remove a User/Organization, which are the owners of the Context objects managed by this component.

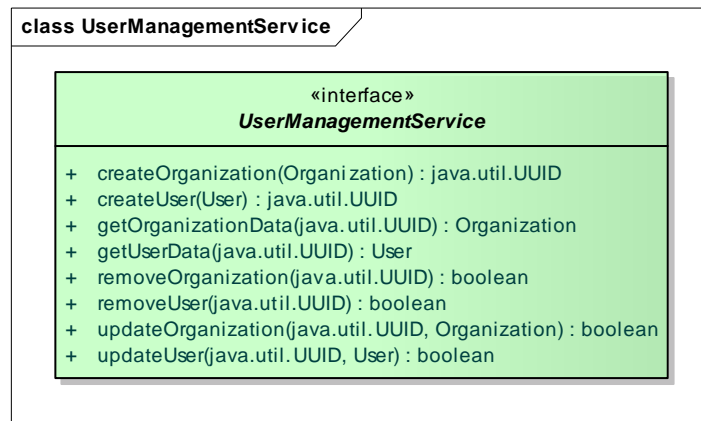
### 3.3.4 Interface overview

The UMS interface provides the following methods/operations that forms the main interfaces exposed by this module as illustrated in Figure 4.

Return	Method/remarks
java.util.UUID	createOrganization(Organization organization)  Creates a new Organization object containing all organization-specific information. It returns the unique identifier for the new Organization object.
java.util.UUID	createUser(User user)  Creates a new User object containing all user-specific information. It returns the unique identifier for the new User object.
Organization	getOrganizationData(java.util.UUID organizationId)  Gets the Organization information given its unique identifier. This method should be used by the Context Client to simplify the createContext operation of the CMS. From this information the CMS is able to define some basic constraints as SpatialConstraint or LanguageConstraint.
User	getUserData(java.util.UUID userId)  Gets the User information given its unique identifier. This method should be used by the Context Client to simplify the createContext operation of the CMS. From this information the CMS is able to define some basic constraints as SpatialConstraint or LanguageConstraint.
boolean	removeOrganization(java.util.UUID organizationId)  Removes the Organization object given its unique identifier. It could be deleted if (and only if) its user list is empty and there are no other references to this Organization. It returns true is the delete operation is successful.
boolean	removeUser (java.util.UUID userId)  Removes the User object given its unique identifier. It could be deleted if (and only if) the list of this context in the system is empty. It returns true is the delete operation is successful.
boolean	updateOrganization (java.util.UUID organizationId, Organization organization)  Edits and stores the Organization specific information given its unique

	identifier and the new information itself It returns true is the update operation is successful.
boolean	<p>updateUser (java.util.UUID userId, User user)</p> <p>Edits and stores the User specific information given its unique identifier and the new information itself. It returns true is the update operation is successful.</p>

**Table 6: API descriptions of the User Management Service.**



**Figure 4: Interface of the User Management Service.**

## 4 Information Viewpoint

This chapter describes the information viewpoint of the Context Service component and covers data structures that are being used for storage and exchange between the services components defined in the computational viewpoint. The description of specific structures that the CS component exchanges with other components and users via their public interfaces are only named because the complete description is given in the HUMBOLDT Commons Specification document.

### 4.1. Context Service

Figure 5 shows all the interfaces needed to create/persist, update and remove *Context* information in HUMBOLDT:

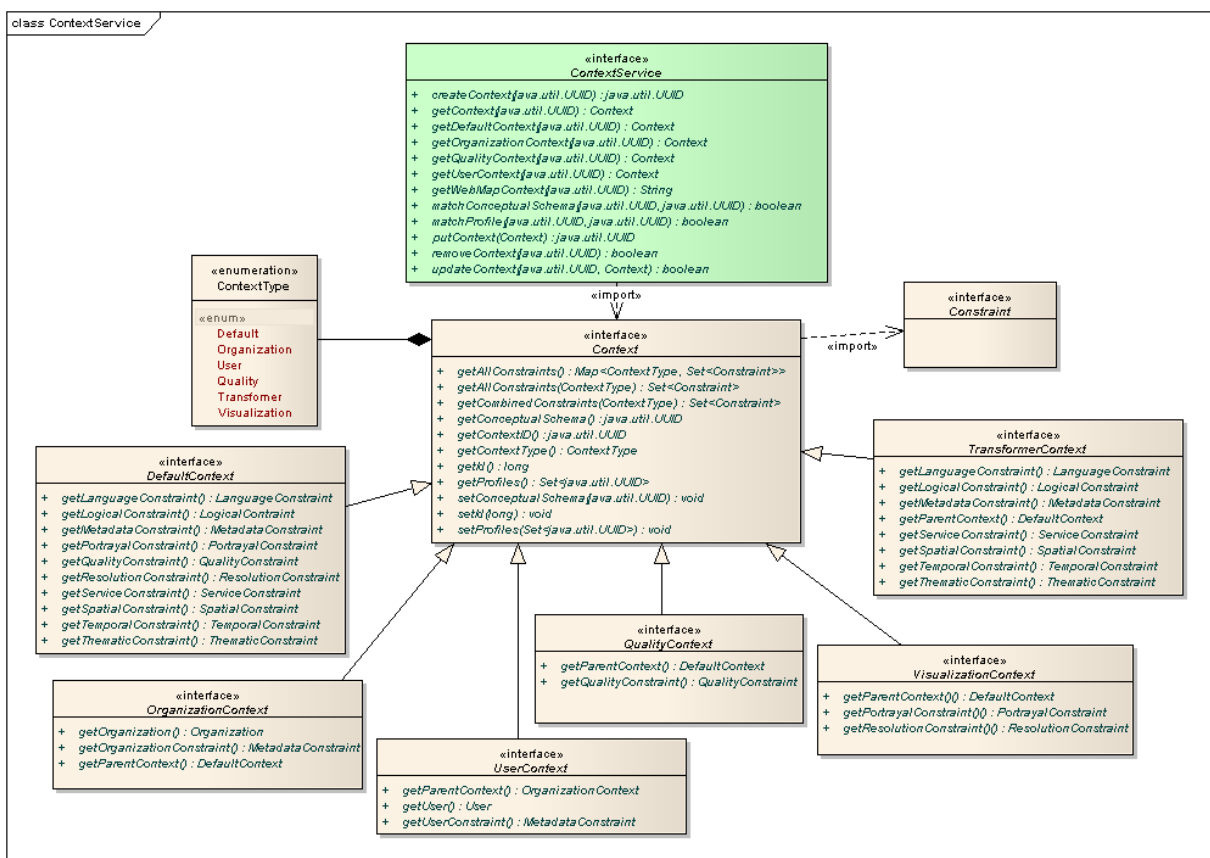


Figure 5: Complete information model for the Context Service.

There are defined six types of contexts:

- ◆ **Default:** the standard set of attributes defining the common context for a specific domain or application, giving access to general preferences like language, resolution..
- ◆ **Organization:** the refinement of a Default Context for its use in a specific organization.
- ◆ **User:** the refinement of a Default Context for the specific use of the client.
- ◆ **Quality:** the QualityConstraint, as part of a Context.
- ◆ **Transformer:** it provides the subset of constraints related to transformers, as part of a Context.

- ◆ **Visualization:** it only provides the constraints related to visualization, as part of a Context.

## 4.2. User Management Service

Figure 6 shows the main attributes that are the meaningful to define a user and an organization profiles. Where possible, standard types are used, e.g. date/time formats, time zones, UUID, lists and sets.

The operations defined (which are quite self-explanatory) allow an authorized consumer to access these attributes.

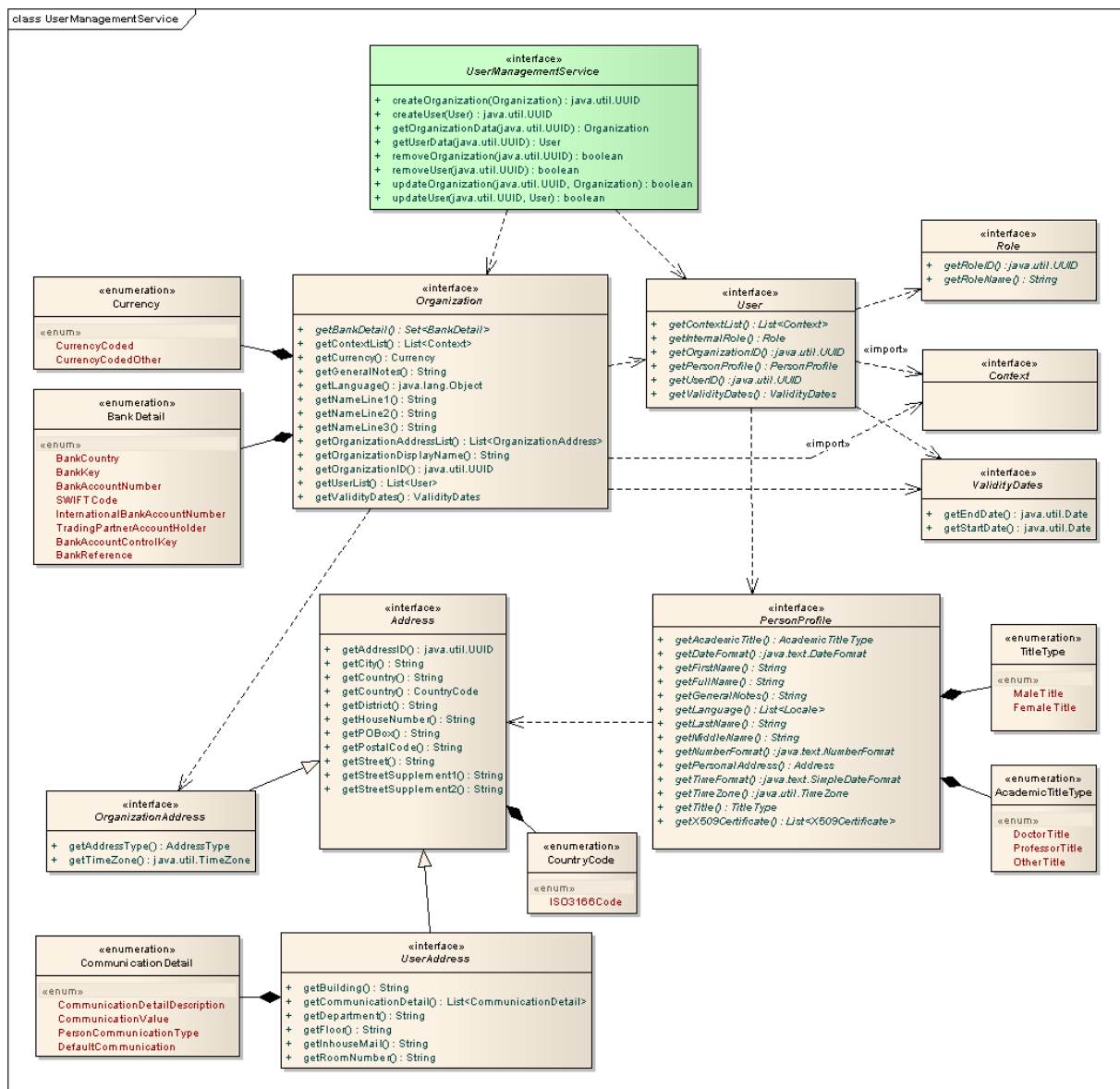
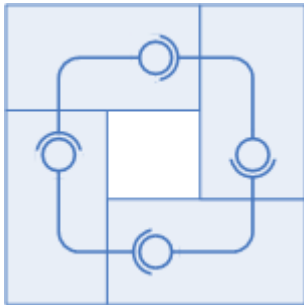


Figure 6: Complete information model for the UMS.

## 4.3. Constraints

Context classes make use of *Constraints* to describe and store different kind of information like metadata, geospatial data, etc. As this structure is used by different components in the framework, its detailed description is given in the HUMBOLDT Commons Specification document (A5.2-D2 [2.1]).

## 5 Summary & Outlook



This specification provided an improvement of the previous Context Service specification –version 1.0 (see <https://intranet.esdi-humboldt.eu/documents/details/751/2>). It is the HUMBOLDT service responsible for the management of users and their contexts.

The Enterprise Viewpoint has been re-written given more details and examples focused on Protected Areas scenario. Moreover some new capabilities have been added, extending the interfaces already defined and implemented. Some changes were necessary in the use of the QualityConstraint because other HUMBOLDT service requirements – the *Data Quality Measurement and Evaluation*. The definition and interface

of this constraint has been extended for being used by the DQME.