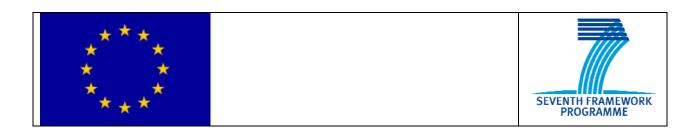# Seventh Framework Programme
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Standardisation Plan V2

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Table of Contents

Index of Figures

Index of Tables

1   Management summary

This document is the deliverable D6.4.2 "Standardization Plan V2" of the TaToo project. It describes the foreseen interaction of the TaToo with the different standards, specifications and standardisation bodies relevant to the project, defines the concept *standard* in the project context as well as the various processes and key persons involved in the standardisation process.

In addition, this document presents an approach to the standards, specification and standardisation bodies relevant to the different project domains as well as the strategies to establish communication with different standardisation bodies.

This deliverable, D6.4.2 Standardisation Plan V2, supersedes the previous version of the document. It is also planned a final version at the end of the project.

1.1   Introduction to TaToo

Efficient discovery of high quality and meaningful information is one of the key unsolved issues in environmental modelling. Metainformation attached to current environmental data repositories have been collected, structured and stored in forms that are meant for human users. Yet, it is hard, if not impossible, to machine process such metainformation. As a result, significant human intervention is required for discovering environmental information.

TaToo, which stands for "Tagging Tool based on a Semantic Discovery Framework", is an FP7 Project sharing the vision of a Single European Information Space for Environment (SISE). It aims to enable experts as well as general users to share trusted and reliable information, but also to allow easy discovery of information which is already available.

The core of the project focuses on the development of tools allowing third parties to easily discover environmental resources (data and/or services residing on different information nodes) on the web as well as to add valuable information in the form of semantic annotations to these resources, thus facilitating future usage and discovery and kicking off a beneficial cycle of information enrichment.

1.2   Purpose of this document

This document aims to define the standardisation approach of the TaToo project.

TaToo objectives related to the standardisation are realized through the definition of activities that include the identification and survey of standardisation initiatives and bodies related with this project, in order of align the project results to these standards and the same way feed and improve as far as possible the current standards.

1.3 Intended audience

TaToo Standardisation Plan is a public document, and targeting both the TaToo Consortium and the external communities interested in TaToo results.

It mainly targets the TaToo personnel dedicated to dissemination and exploitation tasks.

In the case you notice any errors, please contact the TaToo standardization team using the TaToo contact form (http://www.tatoo-fp7.eu/tatooweb/contact)

1.4   Changes in V2

No significant modifications, compared to the initial version of this deliverable (TaToo-D641, 2010) have been made. Minor changes are listed in the following table:

Type of change	New and updated sections
Modifications in Standardisation Teams	3.3.3
Corrections of formatting and typos	3.x; 4.x; 5.x
Modification of Management Summary	1

Table 1.1: Changes with respect to the previous version of the deliverable

2 Terms, Acronyms and Abbreviations

ANSI	American National Standards Institute
BPEL	Business Process Execution Language (WS-BPEL OASIS Standard)
BSI	British Standards Institution
CEN	Comité Européen de Normalisation
CENIA	Czech environmental Information Agency
CHMU	Czech Hydrometeorological Institute
CSU	Czech Statistical Office
CS/W	Catalogue Service for the Web (OGC Standard)
DCMI	Dublin Core Metadata Initiative
DWG	OGC Domain Working Group
EEA	European Environmental Agency
EORTC	European Organisation for Research and Treatment of Cancer
FAO	Food and Agriculture Organization
GRDDL	Gleaning Resource Descriptions from Dialects of Languages (W3C Recommendation)
IACR	International Association of Cancer Registries
IARC	International Agency for Research on Cancer
ICEO	IEEE Committee on Earth Observation
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
iEMSs	International Environmental Modelling Software Society
ISO	International Standards Organization
KSRZIS	Coordination Institute for Health Information Systems
MoU	Memorandum of Understanding
OASIS	Organization for the Advancement of Structured Information Standards
OGC	Open Geospatial Consortium
OGF	Open Grid Forum
OMG	Object Management Group
OWL	Ontology Web Language (W3C Recommendation)
OWL-S	Semantic Markup for Web Services (W3C Submission)
NHIS	National Health Information System
RDF	Resource Description Framework (suite of W3C Recommendations)
RDFa	Resource Description Framework – in – attributes (W3C Recommendation)
RIF	Rule Interchange Format (W3C Recommendation)
SAML	Security Assertion Markup Language (OASIS standard)

SPARQL	SPARQL Protocol and RDF Query Language (W3C Recommendation)
SAWSDL	Semantic Annotations for WSDL and XML Schema (W3C Recommendation)
SWE	Sensor Web Enablement (OGC Working Group)
UML	Unified Modelling Language (OMG Standard)
UNMZ	The Czech Office for Standards, Metrology and Testing
UZIS-CR	Institute of Health Information and Statistics, Ministry of Health Czech Republic
W3C	World Wide Web Consortium
WfMC	Workflow Management Coalition
WHO	World Health Organization
WSDL	Web Services Description Language (W3C Recommendation)
WSML	Web Service Modelling Language (W3C Submission)
WSMO	Web Service Modelling Ontology (W3C Submission)
WS-CDL	Web Services Choreography Description Language (W3C Candidate Recommendation)
XACML	eXtensible Access Control Markup Language (OASIS Standard)
XML	Extensible Markup Language (W3C Recommendation)
XPDL	XML Process Definition Language (WfMC Standard).

3 TaToo Standardisation Approach

The TaToo standardisation approach defines the way how the project will interact with the standardisation bodies. This section defines the concept of standard for the project consortium, and organizes the Standardisation Team that will execute the standardisation process defined in this section.

3.1 Definition of Standard

A Standard in the context of the TaToo project is defined as a formal document that builds the uniform vision of a process, methods, practices or technical issues. Currently is possible identify the following types of standards:

- A *de facto* **standard** is produced when a product, convention, technology or system has achieved a dominant position by public acceptance or market forces. A facto standard generally becomes the basis of a standardisation initiative that can produce a consortium recommendation or a *de jure* standard.

- A *de jure* **standard** is emitted by entities with legal power in a national (i.e. BSI, ANSI) or international (i.e. ISO, CEN, IEEE, W3C) scope.

- **Consortium recommendations** are given by groups of companies with a high level of relevance in a specific domain, suggesting a specific technological element to satisfy a particular necessity.

With regard to the standardisation bodies, it is possible to classify these organizations as **official and unofficial consortia**. The official consortia are formalized standardisation bodies with clearly identified procedures, this kind of consortia includes community alliances and forums to discuss particular interest for a community (i.e. W3C, OMG, OASIS, IEEE); on the other hand an unofficial consortia are groups of vendors, government entities and research centres that not establish any standardisation body and yet propose new specifications based on their own tools, using market strategies or influence official standardisation bodies.

3.2 Relevance to TaToo

The main technical goal of TaToo project is to produce a set of tools for discovery, tagging and evaluation of information resources. These tools must allow interoperability with other tools and systems. To achieve this, the TaToo project shall indentify and if possible adopt the current standards relevant to technical domains of project. These tools shall be validated within TaToo in three use cases (Climate Change Twin Regions, Agro-Environment Management and Anthropogenic Impact and Global Climate Change). Consequently, the TaToo project considers thematic standards related with theses domains.

TaToo does not aim to produce new standards, and its standardization-related activities shall mainly concentrate on deploying the existing and upcoming standards and exchanging the information on best practices, deficiencies and possible improvements with the relevant standardization working groups.

TaToo consortium shall consider following types of contributions to standardisation activities:

- **Dissemination activities within Standardisation bodies:** The project results shall be presented to the appropriate standardisation bodies. This can be seen as a first step towards raising awareness on TaToo project and influencing current and future standardisation initiatives. These dissemination activities will present the project experiences when applying current standards to the specific project necessities. The proposed dissemination will be addressed to key participant at different levels of the standardisation activities (e.g. standardisation bodies, companies and people active in standardisation activities).

- **Profiles:** The consortium has the option of producing profiles that present the way of applying specific standards in a concrete and difficult use case, these profiles will be produced from the best practices applied in the project.

- **Recommendations:** TaToo project shall document the experiences with use and adaptations of current standards or specifications based on the profiles encountered during the course of the project, in the form of "technical reports", "recommendations" or "best practices".

3.3   TaToo Standardisation Team and Process

Full cooperation of all TaToo partners and a well defined information flow are pre-requisites for achieving the TaToo standardisation goals. This document section therefore defines a set of objectives, roles and process related to TaToo standardization

Figure 1 gives an overview of the organization of the TaToo Standardisation Team which will care about the standardisation issues described behind.

Figure 1: TaToo Standardisation Team Structure

3.3.1 TaToo Standardisation Team Objectives

As mentioned above, the main objectives of the TaToo Standardisation Team are (1) assuring the correct implementation of the current standard in the project process and results, and (2) assuring a bi-directional communication between the TaToo project and the standardisation bodies in accordance with the project objectives and available resources. In order to achieve these goals, the standardization team shall:

- Obtain and share continuously with the TaToo consortium the information about of relevant standardisation events as standardisation bodies meetings (e.g. OGC meetings, OASIS meeting or conferences) or meetings with key actors of standardisation activities during the project lifetime, in order to increase awareness of the relevant standardisation activities and incentive the project participation with those activities.

- Monitor changes or updates in the current standards or any new standard relevant to the project in order to assure that project incorporate the most-to-date standardisation framework.

- Identify and disseminate the potential contributions of TaToo of the current standards and specification (suggestion of improvements, extension proposal or complete new standards) showing the scope and impact of these contributions.

- Disseminate all results of TaToo project to the appropriate standardisation bodies to gather feedback about this results and the potential impact of project. Influence in different ways future standardisation initiatives.

3.3.2   TaToo Standardisation Team Roles

TaToo Standardisation Leader

The TaToo Standardisation Leader is the coordinator of the Standardisation Team and editor of all version of the Standardisation Plan.

User Domain Standardisation Leader

TaToo Tools are intended to solve concrete problems in the three Validation Scenarios, and the respective domains. Each domain requires in-depth expert knowledge to assure high quality results. To address the domain problem TaToo Tools shall have to adopt the relevant domain specific standards. User Domain Standardisation Leaders (three in total, one for each domain) will identify relevant domain standards and assure their appropriate adoption within the TaToo project.

Technical Coordinator

The Technical Coordinator will act as domain standardisation leader in the technological aspect with the help of technical domain leaders for each of the key technical domain of the project (Security, Semantics, Business Process, Digital Repositories and Information Retrieval).

Domain Leader

The Domain Leader is an expert in a thematic domain and supports the Technical Coordinator in his/her respective thematic domain.

3.3.3 TaToo Standardisation Team

TaToo Standardisation Leader: ATOS

User Domain Standardisation Leader

- **Climate Change Twin Regions:** AIT

- **Agro-Environment Management:** JRC

- **Anthropogenic impact and global climate change:** MU

Technical Coordinator: TPZ

Technical Domain Leaders

- **Semantics:** ATOS

- **Business Process:** TPZ

- **Security:** CISMET

- **Digital Repositories and Information Retrieval:** IDSIA

3.3.4 TaToo Standardisation Process

As was mentioned before, the TaToo standardisation process mainly encompasses two tasks:

- **Identification of relevant standards and standardisation bodies**: The first step is to identify all current standards, standardisation bodies and groups with potential impact with the TaToo project. The result of this task is a set of standards and recommendations which can be used in the project and also a list of standardisation bodies which TaToo can contribute to.

- **Standardisation activities:** The standards used in the TaToo will be evaluated according the project experiences in order to improve the current standards through comments, dissemination activities, modification/extension to current standards or even influence the creation of new standards.

As this plan has several releases through the project lifetime, the following steps have to be followed:

- The Technical Coordinator (supported by the technical domain leaders) and the user Domain Standardisation Leaders ask for updates in the current project related standards.

- The responses from the previous step are submitted to the TaToo Standardisation Leader.

- The TaToo Standardisation Leader prepares a new version of the Standardisation Plan.

To collect the information that feeds the standardisation plan, the TaToo Standardisation Team shall fill-in the following questionnaire:

- Are you aware of any specifications potentially relevant to TaToo, that aren't covered by TaToo Standardization Plan?

- Are you aware of any standardisation groups potentially relevant to TaToo that aren't covered by TaToo Standardization Plan?

- Are you aware of any standards (used by or planned to be used by TaToo) that became deprecated, replaced by other standards, etc.?

- Which standards have been adopted within TaToo?

- Which TaToo results should be disseminated to standardisation bodies?

- Which TaToo's solutions (or best practices), use-cases, identification of problems, development, experiences should be considered as a contribution to existing standards?

- Which TaToo's solutions, use-cases, identification of problems, development, or experiences demonstrate a need for extensions of standards?

3.4 Template for describing the standards/specifications

In order to gather in a coherent way the information of the relevant standards/specification for TaToo, the following template is proposed:

Standard/Specification	Name of the standard or specification
Standardisation Body and Authors	Standardisation body and authors that produced the standard/specification
Group	Working group inside the standardisation body responsible for this standard or specification
Description	Brief description of the standard/specification
Related standards	Other standards associated with or relevant to this standard/specification
Status	Current status (started, draft, beta, completed, widely adopted)
Contribution to the project	Relevance of this standard to TaToo Project

4 List of relevant standardisation bodies

This section lists the standardization bodies relevant to TaToo. The TaToo Standardisation Team shall monitor these organizations during the project lifetime in order to identify, document and analyze any potential change relevant of standardisation issues in the TaToo project. In the case you notice any errors, please contact the TaToo standardization team using the TaToo contact form (http://www.tatoo-fp7.eu/tatooweb/contact).

For some of the standardisation organizations described below, there are not associated standards in the section 5 in this version of standardisation plan. However, those institutions must be considered according to their relevance in the different domains of TaToo project and might provide relevant inputs in future versions of this document.

4.1 Standardisation bodies relevant to TaToo technical domains

TaToo will develop a set of tools for discovery, annotation and evaluation of information resources. During this development a set of technical standards must be considered in order of assure the use of good practices in all development life-cycle and the interoperability of the results with future developments. Relevant standards are developed and issued by following standardisation bodies:

4.1.1 World Wide Web Consortium (W3C)

The World Wide Web Consortium is the main international standards organization for the World Wide Web. The consortium is made up of 317 member organizations which maintain full-time staff for the purpose of working together in the development of standards for the World Wide Web. W3C also engages in education and outreach, develops software and serves as an open forum for discussion about the Web.

W3C working groups most relevant for TaToo project are listed below:

- **Geolocation Working Group:** it is part of the Ubiquitous Web Applications Activity; its objective is to define a secure and privacy-sensitive interface for using client-side location information in location-aware Web applications.

- **OWL Working Group:** Maintains OWL (Ontology Web Language) in order to improve the machine interoperability of Web Content.

- **RDFa Working Group:** Supports the developing use of RDFa for embedding structured data in Web documents in general.

- **RIF Working Group:** Provides W3C Recommendations for rules interchange.

- **Semantic Web Interest Group:** it is a forum to support developers and users of Semantic Web technologies (RDF, OWL, SPARQL, etc). The group in particular serves to help developers create vocabularies and applications to support a Web data marketplace combining harvesting, syndication, metadata and Web Service techniques.

- **SPARQL Working Group:** Maintains SPARQL, the query language for the Semantic Web providing new features that the community has identified as both desirable and important for interoperability.

4.1.2 Organization for the Advancement of Structured Information Standards (OASIS)

OASIS (Organization for the Advancement of Structured Information Standards) is a not-for-profit consortium that drives the development, convergence and adoption of open standards for the global information society. This consortium produces standards for security, e-business, and execute standardization efforts in the public sector and for application-specific markets. Founded in 1993, OASIS has more over 600 organizations and individual members in 100 countries. The OASIS Technical Committees most relevant to TaToo are:

- **OASIS SOA Reference Model Technical Committee:** Responsible for the Reference Model and Reference Architecture for Service Oriented Architecture

- **OASIS Web Service Secure Exchange Technical Committee:** Define WS-Security extensions and policies to enable the trusted exchange of multiple SOAP messages.

4.1.3 Object Management Group (OMG)

Object Management Group (OMG) is consortium with more than 800 members, originally aimed at setting standards for distributed object-oriented systems, and is now focused on modelling (programs, systems and business processes) and model-based standards. It is responsible of maintaining the Unified Modelling Language (UML) specification.

4.1.4 Workflow Management Coalition (WfMC)

The **Workflow Management Coalition (WfMC)** is a consortium assembled to define interoperability standards in workflow management systems. It was founded in 1993 and now is composed of more than 300 members. It is responsible of maintaining the specification of XML Process Definition Language (XPDL).

4.1.5 Dublin Core Metadata Initiative (DCMI)

The Dublin Core Metadata Initiative (DCMI) is an open organization engaged in the development of interoperable metadata standards that supports a broad range of purposes and business models. Its main objective is to provide simple standards to facilitate the finding, sharing and management of information. This organization provides the Dublin Core metadata set which may be used in TaToo project.

4.1.6 International Standardisation Organization (ISO)

International Standardisation Organization (ISO) is a global network that identifies what International Standards are required by business, government and society, develops them in partnership with the sectors that will put them to use, adopts them by transparent procedures based on national input and delivers them to be implemented worldwide. ISO is composed by a federation of the national standards bodies of 157 countries, one per country, from all regions of the world, including developed, developing and transitional economies.

ISO is directly or indirectly involved with almost all of the standards relevant for the TaToo project. For this reason the interaction with this standardization body is considered mandatory.

4.1.7 European Committee for Standardization (CEN)

European Committee for Standardization is a major provider of European Standards and technical specifications. It is the only recognized European organization according to Directive 98/34/EC for the planning, drafting and adoption of European Standards in all areas of economic activity with the exception of electro-technology and telecommunication. CEN is composed by national standardisation bodies of 31 Member countries.

In 1991 CEN and ISO signed the Vienna Agreement that ensures technical cooperation by correspondence, mutual representation at meetings and coordination meetings, and adoption of the same text, as both an ISO Standard and a European Standard.

As European Commission funded project, TaToo must considered any standard and specification proposed by CEN.

4.1.8 Open Geospatial Consortium (OGC)

The Open Geospatial Consortium (OGC) describes itself as "an international industry consortium of currently over 400 companies, government agencies and universities participating in a consensus process to develop publicly available interface standards. OpenGIS® Standards support interoperable solutions that "geo-enable" the Web, wireless and location-based services, and mainstream IT. The standards empower technology developers to make complex spatial information and services accessible and useful with all kinds of applications"[1].

OGC standards provide the well-defined service interfaces (e.g. WMS - Web Map Service, SOS – Sensor Observation Service …) for the access as well as the modelling and encoding rules (GML - Geography Markup Language, O&M - Observations and Measurements) for the definition and description of (geo-spatial) information. Thus, the adoption of OGC standards for TaToo specifications and implementations is perfectly in-line with SISE requirements like "seamless access to environmental resources".

OGC is also closely related to ISO and CEN 287, thus on a long term perspective contributions to OGC will have effects on ISO TC211 (International Organization for

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[1] http://www.opengeospatial.org/ogc

Standardisation – Technical Committee 211) and CEN 287 (European Committee for Standardisation) via the established OGC channels.

Following OGC working groups are strongly related to TaToo activities:

- **Catalogue WG**
  "The Catalogue Working Group is responsible for collection of requirements, technology discussions, presentations, and other activities related to OGC work on interface specifications for Catalogues. Catalogue enables the collection, maintenance, and access of content and service metadata for the dynamic discovery of resources. The Catalogue Working Group is also the forum for discussion, development, and approval of Profiles of the OGC Catalogue Specification"[2].

- **Security DWG**

  "It is the mission of the Security DWG to establish an interoperable security framework for OpenGIS Web Services to enable protected geospatial information processing. Current specifications of the OGC do not include security related aspects. In order to enable protected geospatial information processing and licensing, it is relevant to describe how to handle security related aspects in an interoperable way. This can be achieved by leveraging existing IT-standards"[3].

- **Sensor Web Enablement WG**
  "OGC members are specifying interoperability interfaces and metadata encodings that enable real time integration of heterogeneous sensor webs into the information infrastructure. Developers will use these specifications in creating applications, platforms, and products involving Web-connected devices such as flood gauges, air pollution monitors, stress gauges on bridges, mobile heart monitors, Webcams, and robots as well as space and airborne earth imaging devices"[4].

Close and pro-active collaboration with these groups can be expected since many TaToo partners are either members of the OGC or have experience regarding OGC consultations from former projects like SANY and ORCHESTRA. TaToo shall strive to establish a good working relationship with the OGC and utilise the participation at OGC meetings to frequently present and discuss information on TaToo activities and results.

4.2 Standardisation bodies relevant to use case domains

In addition to standardisation bodies relevant to TaToo technical domains, the project also has to consider the standardisation bodies relevant to the user cases domain. These include:

- **Agricultural Information Management Standards Initiative:** It is a United Nations Food and Agriculture Organization (FAO) initiative that pretends harmonizes the decentralised efforts in the development of methodologies and standards and applications

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[2] http://www.opengeospatial.org/projects/groups/catwg
[3] http://www.opengeospatial.org/projects/groups/securitydwg
[4] http://www.opengeospatial.org/projects/groups/sensorweb

related with Agricultural Information Management Systems. This initiative is the responsible of AGROVOC vocabulary.

- **UZIS-CR**: Institute of Health Information and Statistics, Ministry of Health CR (http://www.uzis.cz) - the main task and object of activity of the Institute is management and co-ordination of the National Health Information System (NHIS), including its further development and improvement. The functions of NHIS include collection and processing of information concerning health and health care, management of national health registries, provision of information in the extent determined by law and other regulations respecting protection of personal data, and exploitation of this information in health research. The tasks of UZIS CR and of NHIS are defined by Act no. 20/1966 Sb. on National Health Care, in wording of later amendments - §67c.

- **KSRZIS:** Coordination institute for health information systems[5] - part of Ministry of Health, coordination institute for department healthcare information systems.

- **IARC**: International Agency for Research on Cancer[6] - part of WHO (World Health Organization) - evaluation of international oncological data, methodology of data analysis, research of oncological diseases

- **IACR**: International Association of Cancer Registries[7] - standardization of collection of population oncological data, quality of collecting, validation

- **EORTC**: European Organisation for Research and Treatment of Cancer[8] - standards of clinical research in oncology, standards of oncology therapy

- **CSU**: Czech Statistical Office (http://www.czso.cz) - standardisation of population data, death rate.

- **CHMU:** Czech Hydrometeorological Institute[9] - standardisation for collecting and publishing of hydrometeorology data.

- **CENIA**: Czech environmental Information Agency[10] - standardisation of collecting and publishing of environmental data.

- **EEA**: European Environmental Agency[11] - proposed Shared environmental information system (SEIS) - collaborative initiative of the European Commission. It aims to improve the availability and quality of information needed to design and implement the European Union's environment policy, streamline data handling by connecting existing information systems and providing online information services, modernise environmental reporting to reduce the administrative burden both at national and international level, and foster the development of information services and web-based applications.

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[5] http://www.ksrzis.cz
[6] http://www.iarc.fr/
[7] http://www.iacr.com.fr/
[8] http://www.eortc.be/
[9] http://www.chmi.cz
[10] http://www.cenia.cz
[11] http://www.eea.europa.eu

- **UNMZ**: The Czech Office for Standards, Metrology and Testing[12] - was established by the Czech National Council Act No. 20/1993 Coll. on the Organisation of the State Administration in the Field of Standards, Metrology and Testing as the state administration body responsible for such activities. The Office is a budgetary organisation subordinated to the Ministry of Industry and Trade. The Office's mission is to perform tasks set out in Czech legislation on technical standardisation, metrology and testing and tasks related to the harmonisation of Czech technical regulations and standards with the technical regulations of the European Community. Since 2009, the Office has been ensuring development and publication of Czech standards.

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[12] http://www.unmz.cz

5 Standards relevant to TaToo

This section contains a list of the standards relevant for the TaToo project. The standards presented in this first version of the standardisation plan were elicited from the initial TaToo architecture, the TaToo Description of Work (TaToo DOW, 2010) and also from previous deliverables as Consolidation report V1 (TaToo-D641, 2010).

5.1 Technical Standards

For the TaToo project, technical standards are all those related with the tools and technologies used to develop the different software tools provided in this project. Those standards cover different domain as Semantics, Business process, Security, Digital Repositories, Information Retrieval, Geographical information. Semantics

- Resource Description Framework (RDF), W3C Recommendation, http://www.w3.org/TR/rdf-syntax-grammar/, 10 February 2004.

- OWL Web Ontology Language, W3C Recommendation, http://www.w3.org/TR/2004/REC-owl-guide-20040210/, 10 February 2004.

- Resource Description Framework – in – attributes (RDFa), W3C Recommendation, http://www.w3.org/MarkUp/2004/02/xhtml-rdf.html, 10 February 2004.

- Gleaning Resource Descriptions from Dialects of Languages (GRDDL), W3C Recommendation, http://www.w3.org/TR/2007/REC-grddl-20070911/, 11 September 2007.

- SPARQL Query Language for RDF, W3C Recommendation, http://www.w3.org/TR/2008/REC-rdf-sparql-query-20080115/, 15 January 2008.

- Semantic Annotations for WSDL and XML Schema (SAWSDL), W3C Recommendation, http://www.w3.org/TR/2007/REC-sawsdl-20070828/, 28 August 2007.

- Web Service Modeling Ontology (WSMO), W3C Member Submission, http://www.w3.org/Submission/2005/SUBM-WSMO-20050603/, 3 June 2005.

- Web Service Modeling Language (WSML), W3C Member Submission, http://www.w3.org/Submission/2005/SUBM-WSML-20050603/, 3 June 2005.

- Semantic Markup for Web Services (OWL-S), W3C Member Submission, http://www.w3.org/Submission/OWL-S, 22 November 2004.

- Rule Interchange Format (RIF), W3C Recommendation, http://www.w3.org/TR/2010/REC-rif-core-20100622/, 22 June 2010.

5.1.1 Business Process

- OASIS Reference Model for Service Oriented Architecture 1.0. Committee Specification 1, 2 August 2006. http://www.oasis-open.org/committees/download.php/19679/soa-rm-cs.pdf

- 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

- Web Services Description Language (WSDL) 1.1, W3C Note 15, http://www.w3.org/TR/wsdl, March 2001.

- Web Services Architecture. W3C Working Group Note 11, http://www.w3.org/TR/ws-arch/, February 2004.

- Web Services Description Language (WSDL) 2.0, W3C Note 15, http://www.w3.org/TR/wsdl20/, June 2007.

- Unified Modeling Language (UML) Version 2.3, Specification Object Management Group, http://www.omg.org/spec/UML/2.3/, May 2010.

- Web Services Choreography Description Language (WS-CDL) Version 1.0, W3C Candidate Recommendation, http://www.w3.org/TR/2005/CR-ws-cdl-10-20051109/ , 9 November 2005.

- XML Process Definition Language (XPDL) Version 2.1a, WfMC Specification, http://www.wfmc.org/xpdl.html, 10 October 2008.

- OASIS Web Services Business Process Execution Language (WS-BPEL) version 2.0, http://docs.oasis-open.org/wsbpel/2.0/OS/wsbpel-v2.0-OS.html, 11 April 2007.

5.1.2 Geographic Information

Most relevant in the domain of geographical information is the Open Geospatial Consortium (OGC) an organisation responsible for standardisation of geo-spatial data, information and services. This organisation incorporates many Working Groups, e.g. related to Services like the WebMapService or the WebFeatureService or the OGC Sensor WebEnablement (OGC SWE) Group, dealing with Services for standard based Sensor Service Networks like Sensor Observation Services (SOS). OGC is closely related to ISO, thus on a long term perspective contributions to OGC will have effects on ISO TC211 (International Organization for Standardisation – Technical Committee 211) and CEN 287 (European Committee for Standardisation) via the established OGC channels.

Related to geographical services, architecture, and metadata needed in TaToo the following standards might be of interest:

- ISO/IEC 10746-1:1998 (E). Information technology - Open Distributed Processing – Reference model.

- ISO/IEC 10746-2:1996 (E). Information technology - Open Distributed Processing – Foundations

- ISO/IEC TR 14252:1996. Information technology - Guide to the POSIX Open System Environment.

- ISO 19101:2004(E). Geographic information -- Reference model.

- ISO/TS 19103. Geographic information -- Conceptual schema language.

- ISO 19107:2004(E). Geographic information -- Spatial schema.

- ISO 19108:2004(E) Geographic information -- Temporal schema.

- OpenGIS® Web Map Service Standard (WMS) Version 1.3.0, OGC Implementation Specification, 20 January 2004.

- OpenGIS® Web Feature Service Standard (WFS) Version 1.1.0, OGC Implementation Specification, 3 May 2005.

- ISO/FDIS 19109:2003. Text for FDIS 19109 Geographic information -- Rules for application schema, as sent to the ISO Central Secretariat for issuing as Final Draft International Standard.

- ISO 19111:2003(E). Geographic information -- Spatial referencing by coordinates.

- ISO 19112:2003(E). Geographic information -- Spatial referencing by geographic identifiers.

- ISO 19115:2004(E). Geographic Information – Metadata.

- ISO 19119:2005. Geographic Information -- Services (see also ―The OpenGIS Abstract Specification - Topic 12: OpenGIS Service Architecture‖ under http://www.opengis.org/docs/02-112.pdf).

- ISO 19123:2005(E). Geographic Information -- Schema for coverage geometry and functions.

- ISO 19125-1:2004(E). Geographic Information -- Simple feature access -- Part 1: Common Architecture.

- ISO 19136: 2007. Geographic Information - Geography Markup Language (GML). International Standard under publication (2007-07-13).

- ISO/TS 19139:2007. Geographic information -- Metadata -- XML schema implementation.

5.1.3 Security

Security is an important topic for TaToo. Environmental resources and web-based services that can be accessed through TaToo services and tools possibly need to be protected from unauthorised access. Also the access to TaToo's very own public tagging, catalogue, search , etc. services should be regulated to prevent potential misuse.

When establishing access control mechanisms in service orientated architectures we can take advantage of several prominent web service security standards mainly developed by OASIS.

- Security Assertion Markup Language (SAML) V2.0, Technical Overview Working Draft, http://www.oasis-open.org/committees/download.php/20645/sstc-saml-tech-overview2%200-draft-10.pdf 10, 9 October 2006.

- Assertions and Protocol for the OASIS Security Assertion Markup Language (SAML) V1.1, http://www.oasis-open.org/committees/download.php/3406/oasis-sstc-saml-core-1.1.pdf.

- XACML Profile for Role Based Access Control (RBAC), Committee Draft 01, http://docs.oasis-open.org/xacml/cd-xacml-rbac-profile-01.pdf, 13 February 2004.

- Geospatial eXtensible Access Control Markup Language Encoding Standard (GeoXACML) Version 1.0, OGC Implementation Specification, http://www.opengeospatial.org/standards/geoxacml, 20 February 2008.

- eXtensible Access Control Markup Language (XACML) Version 2.0, OASIS Standard. http://docs.oasis-open.org/xacml/2.0/access_control-xacml-2.0-core-spec-os.pdf.

- Web Services Security: SOAP Message Security 1.1 (WS-Security 2004), OASIS Standard Specification, http://www.oasis-open.org/committees/download.php/16790/wss-v1.1-spec-os-SOAPMessageSecurity.pdf

- OASIS WS-Trust 1.3, http://docs.oasis-open.org/ws-sx/ws-trust/200512/ws-trust-1.3-os.doc

- Open Geospatial Consortium Abstract Specification 06-004r4: The OpenGIS® Abstract Specification Topic 18: Geospatial Digital Rights Management Reference Model (GeoDRM RM). Version: 1.0.0. 2006-12-29.

- Open Geospatial Consortium Inc.(OGC 06-103r3): OpenGIS® Implementation Specification for Geographic information – Simple feature access – Part 1: Common Architecture, Version: 1.2.0, Date: 2006-10-05, http://portal.opengeospatial.org/files/?artifact_id=18241.

- Identity Provider Discovery Service Protocol and Profile, OASIS Committee Specification 01, 27 March 2008, http://www.oasis-open.org/committees/download.php/28049/sstc-saml-idp-discovery-cs-01.pdf

- Shibboleth Architecture Protocols and Profiles, 10 September 2005, http://shibboleth.internet2.edu/docs/internet2-mace-shibboleth-arch-protocols-200509.pdf

- Shibboleth Architecture Conformance Requirements, 10 September 2005, http://shibboleth.internet2.edu/docs/internet2-mace-shibboleth-arch-conformance-200509.pdf

- Internet X.509 Public Key Infrastructure (PKI) Proxy Certificate Profile, RFC 3820, http://www.ietf.org/rfc/rfc3820.txt

5.1.4 Digital Repositories and Information Retrieval

- ISO 15836:2009. Information and documentation -- The Dublin Core metadata element set.

- ISO 23950:1998. Information and documentation -- Information retrieval (Z39.50) -- Application service definition and protocol specification.

- Open Search Version 1.1, Specification Draft, http://www.opensearch.org/Specifications/OpenSearch/1.1, December 6, 2005.

- OpenGIS® OpenSearch Geospatial Extensions Draft Implementation Standard, Version 0.0.1, OpenGIS® Discussion Paper, http://portal.opengeospatial.org/files/?artifact_id=35983, 13 October 2009.

- Search Web Services - searchRetrieve Operation: Binding for OpenSearch, Version 1.0, Committee Draft 01, 30 June 2008, http://docs.oasis-open.org/search-ws/v1.0/opensearch-v1.0.html.

- OpenSearch Query Interface standard within CSW 3.0 Specification, Change Request Draft, Ref. "OGC 10-032", https://portal.opengeospatial.org/files/?artifact_id=27338

- OpenGIS® Catalogue Services / Catalogue Service for the Web (CS/W) Version 2.0.2, OGC Implementation Specification, http://www.opengeospatial.org/standards/cat, 23 February 2007.

5.1.5 Others

Web Services for Remote Porlets (WSRP) Version 2.0, OASIS Standard, http://docs.oasis-open.org/wsrp/v2/wsrp-2.0-spec.html, 1 April 2008.

5.2 Standards related with the Use Domains

On the other hand, the standards related with the use domains are those standards that regulates the non-technical knowledge areas involved in the TaToo project, in other words, the areas related with uses cases to which TaToo will provide concrete solutions (Climate Change Twin Regions, Agro-Environment Management and Anthropogenic impact and global climate change), for example:

- **AGROVOC:** Multilingual, structured and controlled vocabulary designed to cover the terminology of all subject fields in agriculture, forestry, fisheries, food and related domains (e.g. environment), FAO/AIMS, http://aims.fao.org/website/AGROVOC-Thesaurus/sub.

6 Partners contribution to standardisation activities

Some of the members of TaToo Consortium currently participate in different standardisation activities; this participation provides a communication channel to the standardisation bodies in order to achieve the TaToo standardisation objectives.

Table 6.1 presents the current contributions of the consortium members with the TaToo related standardisation bodies.

Partner	Person	Body	Group	Contribution	Specification
AIT	Denis Havlik	OGC	SWE Working group	Sensor Service Architecture	Best Practices Paper
CIS	Sascha Schlobinski	OGC	Security DWG	CHARON, GeoXACML Impl.	Best Practices
IDSIA	Andrea Rizzoli	OGC	OGC Hydro.DWG	Representative of iEMSs	Water domain modelling
IDSIA	Ioannis N. Athanasiadis	ICEO	Earth Observation Standards Working Group (ISWG)	Earth Observation Standards Taxonomy	GEOSS Standards and Interoperability Registry (SIR)
TPZ	Fabrizio Pacini	OGC	Catalog 3.0 SWG	follow-up of activities for the standardisation of the OpenSearch Query Interface	CS-W 3.0
TPZ	Luca Petronzio	OGC / OGF MoU	G-OWS	Working Group co-chairing	Security for OGC WS

Table 6.1: Partners contribution to standardisation activities

7 Conclusion

This document defines the scope of the standardisation process in the TaToo project. Project Standardisation Team and process were defined in order to assure the standardisation objectives through the project life time and ensuring future extensions of the TaToo project results and the appropriate dissemination of the results of TaToo project to different standardisation bodies.

8 Acknowledgements

9 References

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TaToo -D641, 2010 Mauricio Ciprián: Standardisation Plan – V1, Deliverable 6.4.1 of TaToo Project, Public Document, 30.06.2010