

3.1 Publishable summary

3.1.1 Project context and objectives

TaToo aims to set up a semantic web solution to close the discovery gap that prevents full and easy access to environmental resources on the Web. The core of the project focuses on the development of tools allowing third parties to easily discover environmental resources on the Web (data and/or services residing on different information nodes) and 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. The proposed TaToo framework is of a generic, application-independent nature and allows the integration of semantics, taking into account the challenges of different domain-ontologies in a multi-domain and multilingual context.

TaToo provides three complex and extensive Validation Scenarios and therefore targets skilled or expert users as the primary user group. TaToo encourages external validation of the usability of its framework and tools by scientific communities such as the International Environmental Modelling and Software Society (iEMSs), the International Federation of Information Processing (IFIP), and members of the Central and Eastern European Centre for Persistent Organic Pollutants (CEEPOPsCTR). TaToo positively stimulate the European Economy because environmental resources will become more attractive by accumulating exploitable descriptions which are enhanced by expert users' knowledge and linked with other knowledge domains.

TaToo has one major objective:

To contribute to closing the discovery gap in the Single Environmental Information Space in Europe for the Environment (SISE) by developing easy to use tools within a semantic framework for discovery of and access to environmental resources in a multilingual and multi-domain context.

This involves a set of scientific and technological objectives that need to be achieved in order to reach the major objective. The scientific objectives of this project focus on the study, evolution, design, and realization of methods that support the discovery of environmental resources on the Web. The main focus here is to: provide a methodology for structuring the acquired meta-information and design and implement a software architecture for the semantically enhanced tagging of environmental resources (data and services), allowing for 'indirect tagging', which is the tagging of resources not directly owned by the tagging user.

The scientific objectives listed above will be converted into technological objectives, in order to deliver a set of tools to support semantic tagging and discovery of environmental resources: a) tool(s) for tagging discovered or already known resources b) tool(s) for semantically based validation, verification and evaluation of tags c) standard or open and published service interfaces to search for and retrieve the semantically tagged resources d) provision of a set of reusable web components which allow independent actors (e.g. service companies or administrations) to move to a business model working as providers of environmental meta-information services or resources of various owners.

3.1.2 Results achieved so far

The third and last period of the project was characterised by the final software development cycle in the core implementation Workpackage (WP4) as well as by the second and third

(final) round of specification and implementation of the Validation Scenarios using WP 4's software developments. Feedback has been collected from the Validation Scenarios and several communities have been contacted during workshops in order to improve the final TaToo System. Workpackage 3 (WP3) provided the final version of the TaToo Framework Architecture including besides the semantic framework also specifications of cross tier services (e.g. for security). Within the implementation Workpackage (WP4) the final version of TaToo's Services as well as User Components (e.g. TaToo Portal for Tagging, Discovery and Evaluation of Resources) have been implemented including semantic annotation, search and evaluation functionalities. The major results achieved so with respect to the objectives of each Workpackage for the final reporting period are described in the following paragraphs.

WP1: Management

Objectives: The project management Workpackage addresses the following objectives: to carry out contractual, administrative, and financial coordination and control, to cooperate and communicate with the Commission; to provide overall RTD organisation, coordination, and control; to represent the project to external parties; and to ensure that preparation and provision of deliverables meet time and quality targets.

Achievements: Throughout the last reporting period a proper project management has been carried out. Task- and Workpackage leaders were well motivated and delivered their deliverables in the main in due time. Overall, no major project delay was encountered.

WP2: Environment Analysis

Objectives: The Environment Analysis Workpackage focuses on analysing the users' / communities' needs and the existing gaps in terms of environmental resource discovery, access, and sharing mechanisms. Furthermore, it provides a technical and technological survey of tools and services already available and usable today. It also covers users' technical requirements, which drive the activities of WP3 and WP4, based on the outcomes of the assessment of users' needs, existing gaps, and the technical and technological state of the art.

Achievements: WP2 has been finished already at the end of the second project period. No specific activities have been carried out during last reporting period.

WP3: Specification

Objectives: Workpackage 3 describes and specifies the Semantic Service Environment and Framework Architecture on an implementation independent level, comprising services, information models, tools and their functions, and interactions and interfaces, and includes conformance to existing standards where applicable.

Achievements: Final Specification of the Semantic Service Environment and Framework Architecture, including final functional specifications of all TaToo Components (tools and services); Introduction of Linked Data principles to provide the possibility to link resources by establishing explicit typed links between them and specification of the new related components; Improvement of the discovery description, provision of more details on the ranking, expansion and limiting algorithms and improvement of the description of the tagging model applied by TaToo; Better explanation and justification of the design decisions taken by the TaToo Consortium while specifying the TaToo Framework Architecture; Overall reduction of the size of the architecture specification document to provide a more focused view on the TaToo Framework Architecture.

WP4: Implementation

Objectives: Workpackage 4 focuses on the detailed design, implementation, and integration of the TaToo Semantic Framework Architecture. This includes design, implementation, and integration of all the necessary semantically enhanced tools and services for harvesting,

discovery, tagging / annotating, ranking, cataloguing, and publishing of resources and associated meta-information. Clients and visualisation components required for the Validation Scenarios and software documentation are also part of the WP4 effort.

Achievements: Detailed specification and final prototype implementation, in particular: The TaToo Portal, providing the following portlet categories: new integrated Tagging (Simple, Advanced and Editing, Geotagging); integrated Discovery (Simple, Hierarchical, Result presentation, SPARQL); Evaluation; Linking; Administration; Further-on, reengineered and enhanced Tagging Tools (server side, client side); Discovery Tools (server side, client side) and Enhanced Semantic Framework have been implemented; Newly added and implemented are Linking Tools (server side, client side), Advanced Geotagging Tools (client side), Geospatial Discovery (server side) and Harvester Connectors to multiple types of resources: Linked Open Data cloud datasets, Masaryk University RDF Catalogue, RDFa Web Site Connector.

WP5: Validation Scenarios

Objectives: Within Workpackage 5 TaToo validates the usability of its products (e.g. TaToo's Framework and Services) through the implementation of three different scenarios. All three scenarios are embedded in highly complex environmental domains and are therefore mainly addressed to domain expert groups and communities as well as to technically skilled users. The scenarios are tackling the following environmental domains:

- Scenario 1 – Climate Change Twin Regions – Discovery Platform (led by AIT)
- Scenario 2 – Agro-Environmental Management – Discovery model components (led by JRC)
- Scenario 3 – Anthropogenic impact and global climate change (led by MU)

Achievements: During the third reporting period the three Validation Scenarios have focussed on establishing the final technical specifications of the functions to be offered to end-users in each case study. An intermediate version of the implementation of the scenarios was made available towards the end of June, before the iEMSs 2012 conference, where a group of selected experts have been testing the various features provided by the scenarios' websites. The feedback from the users was also an important element to produce the final releases of the pilot web-applications, which implemented the features offered by the latest and final version of the TaToo framework. The final step in this workpackage was performed with the final evaluation, where both online questionnaires and onsite evaluations were conducted. The outcomes of this final evaluation, together with the online evaluation of the TaToo framework, are collected in a published deliverable which provides a clear indication for the future exploitation and use of the outcomes of the TaToo project.

WP6: Dissemination & Outreach

Objectives: Workpackage 6 mainly aims to guide the project towards a viable exploitation and dissemination strategy as well as to consolidate the partners' knowledge throughout the project life time. During the third reporting period, the Workpackage Tasks include preparation of the final version of the exploitation plan aiming at the commercial exploitation of the TaToo project's results in a global scale; revision of the standardisation approach; dissemination of the project's results in adjacent communities (e.g. scientific as well as end users communities related to the Validations Scenarios); and provision of knowledge consolidation throughout the project life cycle.

Achievements:

- Continuous updates of public web site
- Production of brochures for different community targets. Final design printed. Electronic version available on the website:
 - <http://www.tatoo-fp7.eu/tatooweb/tags/brochures>

- Elaboration of final version of the exploitation plan with references to the exploitation agreement to be signed by the Consortium. The deliverable collects the list of the TaToo exploitable results as well as the licensing framework
- Participation in iEMSs Conference with a TaToo (hands-on) workshop
- Delivery of updated Standardisation Plan and Consolidation Report
- Production of several publications for conferences

3.1.3 Expected final results and impact and use

The overall project results are:

- The TaToo Semantic Tagging and Discovery Framework
- Tools and services for discovery of resources
- Tools and services for tagging of resources
- Tools and services for evaluation of semantic annotations and resources
- Tools and services for linking TaToo resources with other resources on the web

TaToo's potential impact is manifold. Since decision makers have to deal with a multitude of decision scenarios, it is obvious that they need increasingly precise information within a reasonably short time frame. There is a considerable gap between the services becoming available and the use of such services in the every-day work in the users' semantic context and environment. TaToo, through its tagging and discovery capability, will significantly reduce the time required to discover and use proper, current, and precise information for the different users within the environmental domain. TaToo tools and services will ease the use and the provision of discoverable information fostering the European wide initiative to set up a Single Information Space in Europe for Environment (SISE). TaToo will contribute significantly to European social objectives by providing end-users with better access to accurate, understandable (semantically enhanced) environmental and climate change information without technical or language restraints. TaToo enables EU citizens to become a vital part of the Single Information Space in Europe!

3.1.4 Project Web Page

- The project web page can be found at: www.tatoo-project.eu

3.1.5 List of Beneficiaries

AIT Austrian Institute of Technology GmbH (AIT), Austria (Project Coordinator)

ATOS SPAIN S.A. (ATOS), Spain

cismet GmbH (CIS), Germany

SCUOLA UNIVERSITARIA PROFESSIONALE DELLA SVIZZERA ITALIANA (SUPSI), Switzerland

Masarykova univerzita, Czech

COMMISSION OF THE EUROPEAN COMMUNITIES – DIRECTORATE GENERAL JOINT RESEARCH CENTRE – JRC (JRC), Belgium

TELESPAZIO S.P.A (TPZ), Italy