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GIGAS Technology Watch Report Summary Technical Note

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Short Description:
<p>This document reports on the “Technology Watching” activities of the GIGAS Project by providing abstracts of the set of full Technical Notes generated during “loop 1” of the project. As prime areas of GIGAS interest this document summarizes results of the analysis performed on INSPIRE, GEOSS and GMES related to architecture, resource discovery (catalogue, metadata), data access, data harmonization and user management. It also gives recommendations for loop 2 work.</p>
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1 Introduction

The “GEOSS INSPIRE and GMES Action in Support (GIGAS)” project is a Support Action (SA) aiming at a rapid adoption of standards, protocols and open architectures in support of INSPIRE, GMES, and GEOSS initiatives.

GIGAS is identifying and defining what is needed to enable a full integration of the architectures of the three initiatives via a consensus.

This document provides a summary of the results of the “Technology Watching” activities of the GIGAS Project, which have been performed:

- on the themes and topics identified in [AD3] ,
- according to the methodology defined in [AD2] based on the RM-ODP approach (see also [RD2] and [RD4]),
- and in the scope of GEOSS, INSPIRE and GMES, plus some relevant FP6/FP7 projects and the activities ongoing in relevant international standardisation bodies (OGC, ISO, and CEN).

The document is part of the activities of GIGAS Work Package 2 “Requirements and Architecture Watch” as specified in [AD1]. It represents the top level document of GIGAS deliverable D2.2 “Technology Watch Reports” as defined by [AD1] and provides the basis for D2.3 “Comparative Analysis”.

The document points to a set of Technical Notes on specific topics containing the full details of technical results of the study ([RD1] and [RD5-RD10]). The document contains abstracts of these Technical Notes.

The rest of the document is structured as follows:

- Chapter 1 is an introduction
- Chapter 2 provides an overview on how the work on Technology watch is organised and structured
- Chapter 3 contains the abstracts of the Technical Notes containing the Technology Watch studies
- Chapter 4 provides the lists of the references and acronyms used in the document and a glossary for specific terms as defined within the GIGAS project.

2 Background

GIGAS Technology Watch consists of monitoring the INSPIRE, GMES and GEOSS evolution and analysing the requirements, the standards, the services and the architecture, the models, the processes and the consensus mechanisms with respect to the same elements of the other systems under analysis.

The GIGAS Technology Watch is a continuous process spanning the entire project duration. The project is structured into 2 loops, while the activities in Loop 2 will benefit from the experiences from Loop1. Accordingly, the results of the Technology Watch activities are documented in two versions of the same GIGAS deliverable D2.2a (Loop 1) and D2.2b (Loop2).

GIGAS Technology Watch also monitors the relevant FP6/FP7 research and development (R&D) solutions and contributions as well as the relevant activities in the fields of standard research and development in order to understand and derive any impact coming from them or affecting them.

The Technology Watch (or Requirements and Architecture Watch in the picture below from [AD2]) is the core of the WP2 activities and consists of an in depth analysis of the items identified by the refine scope and targets [AD3] and by employing the methodology for technology watch [AD2] as defined at the beginning of the GIGAS project.

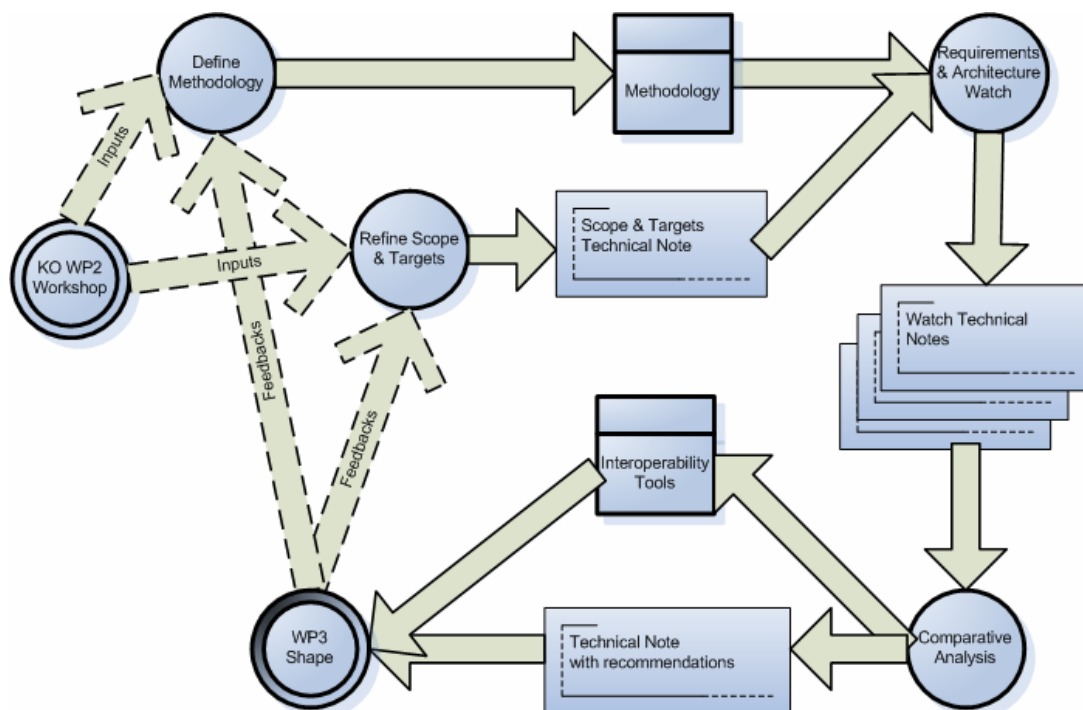


Figure 1 GIGAS WP2 Schema



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Based on the results of the Technology Watch as documented in the individual Technical Notes of Deliverable D2.2a, the subsequent Comparative Analysis formulates draft recommendations for further elaboration in WP3. The results of the Comparative Analysis are documented in the GIGAS Deliverable D2.3.

The Technology Watch in GIGAS is organised according to a set of thematic areas or themes:

- Architecture
- Catalogue-Metadata-Discovery
- Data Access
- Data Harmonisation – Semantic Interoperability
- User Management.

The details of interest associated with these themes have been defined after the refine scope and target process in [AD3].

The Technology Watch activities in loop1 have been performed on the following topics derived from the outputs of the refine scope and targets document [AD3] and from the workshop held at GIGAS kickoff meeting [RD3].

The topics per theme are

1. Architecture, see [RD1]. Architecture interoperability is in the core definition of the GIGAS purpose and scope. It was immediately identified during the kickoff workshop [RD3] and it is presented as high priority topic in the refine scope and target [AD3]. Several partners are involved according to their competence.
2. Catalogue, Metadata and Resource Discovery, see [RD5]. Catalogue interoperability and the related aspects of metadata and resource discovery were immediately identified during the kickoff workshop [RD3] and catalogue is present as high priority topic in the refine scope and target [AD3]. Several partners are involved according to their competence.
3. Data Access:
 - Sensor Planning Service has been identified during the refine scope and target [AD3] as a candidate topic for interoperability opportunities. A specific Technology Watch study is contained in [RD6].
 - Ordering has been identified during the refine scope and target [AD3] as a candidate topic for interoperability opportunities. A specific Technology Watch study is in [RD8].
 - Web Map Service, WMS, has been identified during the refine scope and target [AD3] as a candidate topic for interoperability opportunities. A specific technology watch study is in [RD9].
4. Data Harmonisation – Semantic Interoperability:



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- Observation and Measurements has been identified during the Refine Scope and Target [AD3] as a candidate topic for interoperability opportunities. A specific Technology Watch study is in [RD10].
5. User Management has been identified during the Refine Scope and Target [AD3] as a candidate topic for interoperability opportunities. A specific Technology Watch study is in [RD7].

For the complete results of the Technology Watch study see the above mentioned Technical Notes [RD1], [RD5], [RD6], [RD7], [RD8], [RD9] and [RD10]. For the overview, the abstracts of all Technical Notes are included in the next chapter.

3 Abstracts

3.1 Architecture

One of the GIGAS primary goals is to foster architectural coherence between INSPIRE, GMES and GEOSS thus facilitating collection and harmonization/convergence of respective service requirements at the level of standards.

The Architecture TN [RD1] contains a survey on the architectures and on the architectural approaches used in GEOSS, INSPIRE and GMES. The survey is complemented by an analysis of the architectures of relevant FP6/FP7 projects and by documenting related activities in the standardisation bodies.

In short:

- The GEOSS section in [RD1] presents the enterprise, information, engineering, computational and technology viewpoints of the GEOSS Architecture.
 - The development of GEOSS has involved the definition of an Initial Operation Capability (IOC) and the implementation of an Architecture and Implementation Pilot (AIP).
 - The requirements for the architecture were derived from the GEOSS Ten-Year Implementation Plan and from GEO Tasks undertaken by GEO members and participating organizations.
- The INSPIRE section in [RD1] provides a high-level overview of the current understanding of the technical architecture of INSPIRE. It illustrates the required elements within the infrastructure, their relationships and the responsible parties for drafting the relevant specification.
 - This is work-in-progress and is expected to change as a result of the ongoing work on the implementation of INSPIRE.
 - The INSPIRE Directive defines the technical elements of an infrastructure for spatial information to be comprised of "metadata, spatial data sets and spatial data services, network services and technologies." [INSPIRE Directive, Article 3.1]
- The GMES section in [RD1] provides the analysis of the Coordinated Data access System (CDS) Customer Interface which is also known as the EO-DAIL (EO Data Access Integration Layer).
 - In order for the GMES Core Services to deliver the high-level operational services which are needed, it is necessary for them to integrate EO products, i.e. space data, with all kinds of other data and information (so-called in-situ data). The harmonised access to the space data is offered through the CDS.
 - The CDS system and the corresponding interfaces at the participating GMES contributing missions are being designed and implemented by various concurrent studies and projects. The initial preparatory study "HMA-I" started in September 2005 and ended in October 2007.

- In the framework of the GMES EO Component preparatory activities, a number of studies have been initiated ensuring the evolution of the Earth Observation component and services in support to GMES. The “Heterogeneous Missions Accessibility” (HMA) analyses the requirements, evaluates the impact and proposes an approach to allow the desired inter-accessibility across missions forming part of GMES.
- In the framework of GMES, the [RD1] contains the architectural analysis of the following GMES Fast Track Services assumed as relevant in the context
 - GEOLAND-2 the FP7 project implementing the pre-operational GMES Land Monitoring Core Service (LMCS)
 - For a comprehensive understanding of the GMES architecture further inclusion into the GIGAS analysis of the evolving Core Services (atmosphere, emergency response, maritime, and security), of the most important Downstream Services (after they have been selected by the EU), and of interfacing elements of the widely dispersed in-situ data provider infrastructure for GMES will become essential.
- [RD1] contains the architectural analysis of the following FP6/FP7 projects:
 - ORCHESTRA was an FP6 Integrated Project which designed and implemented the specifications for a service oriented spatial data infrastructure for improved interoperability among risk management authorities in Europe
 - SANY (Sensors Anywhere) focuses on interoperability of in-situ sensors and sensor networks
 - GENESI-DR (Ground European Network for Earth Science Interoperations - Digital Repositories) has the challenge of establishing open Earth Science Digital Repository access for European and world-wide science users.
- [RD1] contains the analysis of the architectures as managed in OGC, ISO and CEN.

The Technology Watch Architecture study successfully followed the homogeneous RM-ODP based approach as defined in [AD2]. The RM-ODP based approach:

- enables a comparison and a synopsis of the different architectures on a high level top-down approach,
- is performed for all projects and initiatives by a pool of experts with relevant know-how and expertise,
- has the purpose to identify synergies but also major obstacles for interoperability.

The main results of the Technology Watch Architecture study from Loop 1 activities can be summarized as follows:



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- Different scopes (enterprise viewpoints) of INSPIRE, GMES and GEOSS result in differences in the architecture of the initiatives. It will be important to determine where architectural coherence and cross-initiative interoperability is key and to focus on these aspects.
- Interoperability between GEOSS, INSPIRE and GMES will depend on their ability for reaching a common understanding of the differing information models. It will be important to understand how these different concepts relate to each other in order to achieve interoperability.
- The information viewpoint of the architecture study can be considered to be a preparatory activity to address the issue of semantic interoperability in Loop2.
- Very importantly, the Initiatives share an emphasis on using a Service Oriented Architecture (SOA) approach. For example they all have elements of the Publish-Find-Bind pattern. But there are differences, too. For example, a comparison of the definition of "Service" in each initiative should be made.
- In addition to the analysis on architectural aspects also the schedules of the three initiatives as well as of the FP6/FP7 projects and standardization bodies need to be understood. Internal schedules are asynchronous and not correlated both among themselves and with GIGAS activities; an identification of respective key milestones or intervention points is needed. This has to drive the assignment of priorities to convergence and outreach activities in order to match the necessary deadlines, to provide timely inputs and to receive timely outputs.

3.2 Catalogue, Metadata and Resource Discovery

The Catalogue, Metadata and Resource Discovery TN [RD5] contains the results of the Technology Watch activities on Catalogue, Metadata and Resource Discovery of the GIGAS Project.

The Technical Note describes the status of this topic in the various initiatives, European projects and standardization bodies: INSPIRE, GMES, GEOSS, ISO/TC 211, CEN, OGC, SANY and GENESI-DR. The status of the relevant metadata and catalogue services standards and documents developed in these initiatives and projects is presented using the RM-ODP approach as defined in [AD2].

Metadata and catalogue services are a fundamental part of a spatial data infrastructure. They allow the end user to discover, evaluate and use the available data and services. They are the main entry point into the infrastructure. The three initiatives studied in GIGAS (GEOSS, INSPIRE, GMES) have thus set up catalogue services giving access to metadata instances. They make use of ISO, OGC and OASIS standards and other documents on the topic of metadata and catalogue services:

- Dublin Core,
- ISO 19115/19119/19139,
- OGC GML,
- OASIS ebXML,
- OGC CS-W.

All have similar use cases: discover metadata records in order to access appropriate datasets and services. All apply ISO and OGC standards; however, they use them in their own way and build specific profiles. Further, the chosen technologies are not necessarily compatible with each other.

These different approaches and solutions work within each initiative, but not across initiative boundaries and thus lead to inefficiencies and interoperability limitations:

- A client software developed for GMES catalogue services cannot interact as is with INSPIRE catalogue services and vice-versa. Connector components need to be developed. This means that cross-initiative interoperability is not ensured and that harmonized discovery of data in a cross-initiative scenario is not possible at the moment.
- Solving the same issue in different ways leads to redundant effort and is thus not cost-effective.
- Solving the same issue in different ways does not help INSPIRE, GMES and GEOSS to have a common and strong voice in standardization bodies.



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During the Catalogue Technology Watch activities in Loop 1, it has also been noted that some aspects of the different initiatives were not analysed deeply enough. This will be further investigated in Loop 2.

3.3 Data Access

3.3.1 Sensor Planning Service TN

The Sensor Planning Service technical note [RD6] presents the results of the Technology Watch on the SPS activities within GEOSS, INSPIRE, and GMES.

One main conclusion of the Technical Watching activity states that the Sensor Planning Service is not used and implemented at the same level within the initiatives.

The INSPIRE directive states that “INSPIRE does not require the collection on new spatial data”. However, access to observation (information) coming from EO sensor is within the INSPIRE Directive (Annex II/III) such as Ortho-Imagery and DEM and other themes could have sensors as sources (both EO and In Situ). For those themes, SPS should be used as a possible service in conjunction with others (e.g. WPS) in order to provide access to the data.

In GMES and GEOSS, the implementation of SPS only shows differences on the technical aspect:

- GMES CDS is based on SPS profile with a very detailed interface that restricts the SPS service. This implementation by restriction and not by extension regarding the SPS standard specification should preserve the interoperability. From a technical point of view, SPS is using a SOAP binding.
- GEOSS is based only on SPS version 1.0 using a RESTful binding.

The SPS analysis was complemented by taking into account the usage of SPS in the scope of the EU FP7 project SANY. This project implements a first version of SPS with no recommended binding (this corresponds to the approach applied in GEOSS). Please note that this analysis for SANY was based on SANY Sensor Service Architecture V1. A 2nd version of this document will be released during the project runtime, probably introducing changes to the original approach.

Sensor Planning activity is only a small part of the Sensor Web. The Loop 2 activities should broaden the perspective on Sensor Web in the scope of the generic data access theme.

In the following, please find a list of core issues identified in the Technology Watch on SPS for each of the initiatives:

- GMES CDS: It is very well documented due to the constraint of an existing implementation planning for GMES pre-operational services.
- GEOSS is approaching the global access to sensor and not only from a sensor availability point of view.
- There is no GMES FP6/7 project using SPS, the main reason is due to GMES FP6/7 projects such as Geoland2 for Land Cover are dedicated to value added chain.

- There are other projects from FP6/7 using SPS or other SWE suite services such as SANY. However it is pointed out that for SANY, the information coming from EO sensor are not directly accessed by user. The user accesses only thematic information through value added product (via a SOS).

3.3.2 Ordering TN

The technical note [RD8] presents the results of the Technology Watch on “Ordering” systems. Several Initiatives and Projects have been analysed in order to prepare comparable information allowing overlap and gap analysis in the subsequent Comparative Analysis of the GIGAS project.

In the frame of GMES, both GMES Space Component – Data Access (GSC-DA) and HMA-E Ordering have been investigated also with particular emphasis on standards (i.e OGC 06-141) and e-services (i.e. WPOS).

The watch continued through the INSPIRE and GEOSS initiatives, initially showing a different level of maturity within those initiatives as far as the topic of Ordering is considered. However, although some difficulties have been found in retrieving comparable level of information for the scope of GIGAS, nevertheless it is important to underline that a significant amount of work is in progress within the specification community.

Also, FP6/FP7 projects, like ORCHESTRA, are contributing with inputs to lay down the Implementing Rules (IR) for INSPIRE, although IR for INSPIRE download service were still in draft status at the time of the review.

E-services have also been considered within INSPIRE, with particular focus on the issue of Right Management services (RM), which is considered a relevant topic for further analysis.

For the GEOSS initiative, the analysis showed that the feature of Ordering in GEOSS is still at a preliminary stage of consideration.

The main results of the Technology Watch on Ordering in Loop1 are summarized in the following:

- The OGC 06-141 (Ordering Services for Earth Observation Products) is an OGC best practice document used mainly in the GMES HMA ESA projects.
- Being at that stage the only available specification on EO product ordering it is candidate for recommendation to the other two initiatives INSPIRE and GEOSS.
- GEOSS is open to the adoption of OGC 06-141; this document has already been referenced in the GEOSS AIP-2 CFP-Annex B – Architecture. The Ordering use case elaborated during the GIGAS loop1 activities on Ordering TN have also been propagated to the GEOSS AIP-2 Architecture Team.
- One aspect that has been not been considered during loop1 mainly related to e-services is the analysis of the e-government context in which the INSPIRE legal obligations should fit. This still needs to be analysed before a recommendation of OGC 06-141 to INSPIRE is considered.

3.3.3 Web Map Service TN

The Web Map Service Technology Watch [RD9] documents the Technology Watch activities of the GIGAS Project on Web Map Services.

Following the common GIGAS approach, an RM-ODP analysis has been performed for OGC Web Map Services (WMS) in the context of the three initiatives INSPIRE, GEOSS and GMES looking for interoperability barriers or synergies. The recommendations coming from the development of a WMS Application Profile for Earth Observation, an activity running in parallel to GIGAS, have been taken into account as well.

Technology Watch in loop 1 has shown that in the three initiatives open architecture and international standards are promoted with interoperability being a key objective. ISO 19128 standards and related ISO 19xxx series, in the field of metadata and portrayal web services, are adopted by all of the three initiatives.

However, INSPIRE, in the domain of View Services, defines specific and additional constraints on the implementation of the standard related to the nature of the linked metadata, layer naming and description, right management, multilingualism and protocol binding. Interoperability conflicts between INSPIRE conformant View Services and regular ISO 19128 standard based Web Map Services might therefore be an issue.

Loop 1 has been completed with the result that some interoperability issues exist between the INSPIRE and GEOSS initiatives or the GMES projects the latter two strictly implementing the ISO 19128 WMS standard. Identified issues are:

- SOAP Binding version: SOAP 1.1 (INSPIRE) versus SOAP 1.2 (GEOSS and GMES)
- Multilingualism required by INSPIRE but unsupported by the ISO 19128 standard.
- Nature of linked metadata (metadataURL), INSPIRE supporting only the ISO 19139 related XML format.

Especially, the INSPIRE Technical Guidance for Network Services specifies the use of the SOAP framework maintained in conformity to WS-I Basic Profile 1.2. SOAP 1.1 will be the initial SOAP version used for the INSPIRE framework. The change request 06-094r1 on OWS Common 1.2 SWG recommends the use of SOAP 1.2 as messaging protocol.

On these three main interoperability issues it is planned to carry the analysis in GIGAS further and to provide accurate and concrete recommendations on how to resolve the differences.

Apart from these three main interoperability issues, the following issues can be stated:

- **Multilingualism:** In the INSPIRE document “D3.7.2 Draft Implementing Rules for View Services” the support of the multilingualism is required via a specific work around based on the usage of the ExtendedCapabilities parameter. In ISO 19128, language related parameters remain undefined for request and response (however, the change request 08-016r1 for OWS Common 1.2 SWG is addressing the multilingualism issue). It can be stated that INSPIRE compliant clients (integrated in GeoPortals or applications), would most likely not understand dataset metadata references pointing to



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anything else but ISO 19139 resource since INSPIRE does not support other format description such as e.g. FGDC-STD-001-1998.

- **Opaque-Chaining:** The three initiatives foresee opaque-chaining services which are widely met by ISO 19128 and OGC 06-042.

Consequently suggestions have been made for GIGAS loop 2:

1. to deeply audit on-going work related to the above three interoperability issues in INSPIRE and OGC, ensure respective working group will not move toward different options that lead to interoperability issues and, if required, make recommendation for a common ground,
2. to address the technical trends of Tiled Web Map Service by auditing on going work of the OGC WMS RWG from one hand, and WMTS domain group on the other hand, although both initiatives has not yet reach the standard level,
3. to audit results from the FP6 ORCHESTRA and SANY projects about rendering of time series in connection with the use of WMS.

3.4 Data Harmonisation

3.4.1 Observation & Measurements TN

The Observation & Measurements Technical Note [RD10] contains the results of the technology watch on observation and measurements performed across the GEOSS, INSPIRE, and GMES. Data from observations and measurements form a fundamental element of the information pipeline for all three initiatives:

- INSPIRE, especially the environmental themes in Annex II and III,
- GMES, especially the in-situ component, and space-borne earth observation,
- GEOSS (concerned with observations in support of many societal benefit areas).

OGC has developed over some years an abstract conceptual model for Observations and Measurements (O&M). It has evolved since 2001, reaching a sufficient level of maturity to be formally published by OGC as version 1.0 late 2007. It was recently accepted as a New Work Item by ISO Technical Committee 211 and is now at Committee Draft stage (ISO/CD 19156). In descriptive terms, the model states that

“An observation measures some observed property of a feature-of-interest using a specified procedure, generating a result.”

This pattern may be applied across a broad spectrum of observation types, whether from satellite-borne remote sensing instruments, in-situ samplers, or laboratory-based analyses. O&M may be specialised for particular applications, and offers the potential for developing a harmonised approach to information management across the three initiatives. In particular, O&M provides a key component to define interoperable data models across multiple data themes in INSPIRE, and to develop a coherent architecture for GMES In-Situ Observations. As well, the Information Viewpoint it provides fits neatly within the GEOSS component taxonomy across all the Societal Benefit Areas. The key challenge is to obtain alignment of the GMES activities (Fast-Track Services and In-Situ Observations) and adoption by INSPIRE Annex II and III Thematic Working Groups.

As well as the target initiatives themselves, a number of FP6 and FP7 research projects have used the O&M model. According to an initial analysis performed under GIGAS, roughly a quarter of the projects targeted for analysis have used O&M.

From the analysis in [RD10], a few key opportunities are identified to drive convergence and interoperability:

- interim inclusion of O&M in the INSPIRE Generic Conceptual Model pending its standardisation as ISO/CD 19156
- adoption of O&M by key INSPIRE Annex II and III Thematic Working Groups
- adoption of O&M within any information architecture developed for the GMES In-Situ observations component



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- recognition of the obligation for interoperability on GMES Fast Track Service projects, and the benefits to their mutual adoption (with each other, and INSPIRE) of O&M and the Sensor Observation Service interface specification
- endorsement by the GEOSS Standards and Interoperability Forum for the O&M model
- explicit recognition by GEOSS of the overlaps between the component type 'Observing System or Sensor Network' with the O&M model



3.5 User Management

The User Management Technical Note [RD7] contains the results of the Technology Watch activities of the GIGAS Project on User Management.

The main input to [RD7] are the inputs coming from the Initiative Experts and the publicly available project documents which are identified in the “Reference Documents” section.

In addition to the initiatives, a number of FP6 projects are also monitored which are known to have addressed user management in their architecture. The projects labeled with a “*” have made available non-public project information which have been analysed:

- FP6 ORCHESTRA,
- FP6 WIN (*)
- FP6 SANY (*)

A survey of the applicable standards from the main standardisation bodies such as W3C, OASIS, IETF and OGC have been made. The following standards present important goals of security management (these standards have already been used in GMES CDS to make a CDS tailoring):

- ISO/IEC 17799:2005 Code of Practice for Information Security Management
 - This International Standard establishes guidelines and general principles for initiating, implementing, maintaining, and improving information security management in an organization.
- ISO/IEC 27001 Information Security Management Systems Requirements
 - This International Standard covers all types of organizations (e.g. commercial, government agencies)
- ISO/IEC15408 Evaluation criteria for IT security (i.e. common criteria)
 - Permits independent security evaluations according to a “common criteria” base

User Management is not defined at the same level within the different initiatives although there are many similarities. The GMES CDS DAIL offering is based on mature standards and an instance is currently being implemented in the DAIL implementation project. The DAIL is using SOA based architecture and implements an authentication, authorisation model through SOAP, WS-Security, SAML and LDAP technologies.

The GEOSS initiative sits at a higher level and intentionally has relatively little defined in terms of user management. Authentication and authorization play a key role in protecting GEOSS components and services at all tiers. Currently, the GEOSS Architecture Implementation Pilot does not apply access control to participating web services. However, the OGC Geo Rights Management standard (GeoRM) is expected to form the basis of GEOSS access control in the future.



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There is currently no formal user management activity in INSPIRE, but certain elements proposed by the Drafting Team "Network Services" in the document "INSPIRE Draft Implementing Rules for Data and Services Sharing" hint at the need for one¹. The document requires that user management is implemented since it proposes a license management based on different user types. The situation will hopefully become clearer after the INSPIRE IOC TF (Initial Operating Capability task force) workshop in June 2009.

The FP6 ORCHESTRA project defines an abstract specification in order to cope with user management, authentication and authorisation for specific platforms where different methods are implemented. This abstraction should lead to interoperable solutions being possible.

The FP6 SANY and WIN projects define and implement an instantiation of the ORCHESTRA abstract specification.

For Loop2, it is proposed to extend the current analysis with the following:

- GEODRM
- Security (to be defined exactly what this means/covers)

It is also proposed to extend the current overview of User Management-related Standardisation Bodies and Standards.

4 References, Abbreviations & Glossary

4.1 References

4.1.1 Applicable Documents

- AD 1. Seventh Framework Programme Theme [FP7-ICT-2007-2] GEOSS, INSPIRE and GMES, an Action in Support - Annex I - "Description of Work" - 13/05/2008
- AD 2. GIGAS Methodology for Technology Watch Issue 100
- AD 3. GIGAS Refine Scope and Targets Issue 100

¹ see:

http://inspire.jrc.ec.europa.eu/reports/ImplementingRules/DataandServiceSharing/D4.9_Draft_IR_Data_and_Service_sharing_v2.0.pdf

4.1.2 Reference documents

- RD 1. GIGAS Technology Watch Architecture TN Issue 102
- RD 2. Reference Model for the ORCHESTRA Architecture (RM-OA) V2 (Rev 2.1) OGC 07-097
- RD 3. Report of GIGAS WP2 Workshop: Refine Scope and Targets, Darmstadt, Germany , 11th June 2008
- RD 4. ISO-IEC 10746-1/2/3 Information Technology — Open Distributed Processing — Reference Model
- RD 5. GIGAS Technology Watch Catalogue-Metadata-Resource Discovery TN Issue 103
- RD 6. GIGAS Technology Watch Sensor Planning Service TN Issue 101
- RD 7. GIGAS Technology Watch User Management TN Issue 102
- RD 8. GIGAS Technology Watch Ordering TN Issue 102
- RD 9. GIGAS Technology Watch WMS TN Issue 102
- RD 10. GIGAS Technology Watch Observation & Measurements TN Issue 101

4.2 List of Acronyms

Acronym	Description
CEN	Comité Européen de Normalisation or European Committee for Standardisation
CDS	Coordinated Data Access System
DAIL	Data Access Integration Layer
DGIWG	Digital Geospatial Information Working Group
EO	Earth Observation
FE	Feature Expert
FIG	Fédération Internationale des Géometres or International Federation of Surveyors
FP	Framework Program
FTS	Fast Track Services
GEO	Group on Earth Observation
GEOSS	Global Earth Observation System of Systems
GIGAS	GEOSS INSPIRE and GMES Action in Support
GMES	Global Monitoring for Environment and Security

Acronym	Description
GSC-DA	GMES Space Component – Data Access
ICT	Information and Communication Technology
IE	Initiative Expert
IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force
IFP	Initiative Focal Point
INSPIRE	Infrastructure for Spatial Information in the European Community
ISO	International Organization for Standardization
IT WG	Interoperability Tools Working Group
KO	Kick-Off
M WG	Methodology Working Group
OASIS	Organization for the Advancement of Structured Information Standards
OGC	Open Geospatial Consortium
RASDS	Reference Architecture for Space Data Systems
RM	Reference Model
RM-OA	Reference Model ORCHESTRA Architecture
RM-ODP	Reference Model Open Distributed Processing
RST WG	Refine Scope & Target Working Group
SANY	Sensor ANYwhere
SOA	Service Oriented Architecture
TBC	To Be Confirmed
TBD	To Be Defined
TBV	To Be Verified
TDWG	Taxonomic Database Working Group
TN	Technical Note
UML	Unified Modeling Language



Acronym	Description
W3C	World Wide web consortium
WG	Working Group
WMS	Web Map Service
WP	Work Package

4.3 Glossary

Features

Features are elements to be analysed within GIGAS for interoperability.

Examples of features are:

- Service and Collection Discovery, Catalogue, Ordering, Sensor Planning, WCS, WMS, Architecture, Requirements, Metadata, Persistent Testbed etc.

Feature Expert (FE)

FEs are in charge of analysing their features across the different initiatives and to identify commonalities and discrepancies, always with the final goal of removing interoperability barriers and/or starting a standardisation process.

Initiative

The three main targets of GIGAS: GEOSS, INSPIRE and GMES are referred as “initiatives”.

- The Global Earth Observation System of Systems (GEOSS) is a 10-year global programme that aims to provide to the broad environmental science and user community decision-support tools and aid the monitoring, analysis and modelling of various environmental phenomena through the integration of existing and future sources of earth observation information.
- The Infrastructure for Spatial Information in the European Community (INSPIRE) is a Directive (2007/2/EC) of the European Parliament and of the Council establishing an Infrastructure for Spatial Information in the European Community. To ensure that the spatial data infrastructures of the Member States are compatible and usable in a Community and trans-boundary context, the Directive requires that common Implementing Rules (IRs) are adopted in a number of specific areas.
- The Global Monitoring for Environment and Security (GMES) initiative aims to support Europe’s goals regarding sustainable development and global governance by providing timely and quality data, information and knowledge. In support to the GMES initiative, the HMA project focuses on establishing



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harmonized access to heterogeneous EO missions' data from multiple mission Ground Segments (G/S's), including national missions and ESA Sentinel missions.

Initiative Expert (IE)

IE are in charge of vertically analysing their initiative in terms of requirements and architecture, identifying specific architecture aspects to be candidate for interoperability with the other initiatives.

Initiative Focal Point

Initiative Focal Points (IFPs) are the technical reference for any aspect of the initiatives

The IFPs are the single point of contact with their initiative for any GIGAS partner. GIGAS Partner may ask support to the IFPs and the IFPs are expected to provide responses or to put in contact GIGAS partners with the relevant experts within the initiative.

Standards Organisations

- ISO/TC 211 is the technical committee under ISO with the responsibility for standardization in the field of digital geographic information.
- CEN/TC 287 is the technical committee under CEN with the responsibility for standardisation in the field of digital geographic information for Europe.
- The Open Geospatial Consortium, Inc. (OGC) is a non-profit, international, voluntary consensus standards organization developing standards for geospatial and location based services.