

The GIGAS Project

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GIGAS Project Data

- Full Title: **GEOSS INSPIRE and GMES an Action in Support**
- Funding Scheme: **Support Action**
- Duration: **24 Month**
1st of June 2008 – 31th of May 2010
- Consortium: **19 partners (Co-ordinator Fraunhofer IGD)**



European Commission -
Information Society and Media



GIGAS Objectives

- Promote the coherent and interoperable development of the GMES, INSPIRE and GEOSS initiatives through their concerted adoption of standards, protocols, and open architectures
 - **Analyse the gaps** between the initiatives and **propose strategies** to overcome them
 - **Highlight best-practice examples** from FP6 or FP7 projects for the identified gaps
 - **Initiate a consensus process** on a broad basis for public consultation and consensus building
 - **Shape the initiatives** by providing short term action items
 - **Influence the relevant standardisation bodies** to ensure the long-term action
 - **Provide an agenda for further strategic research areas** to ensure investigation on the problems that are unsolved today

GIGAS Themes

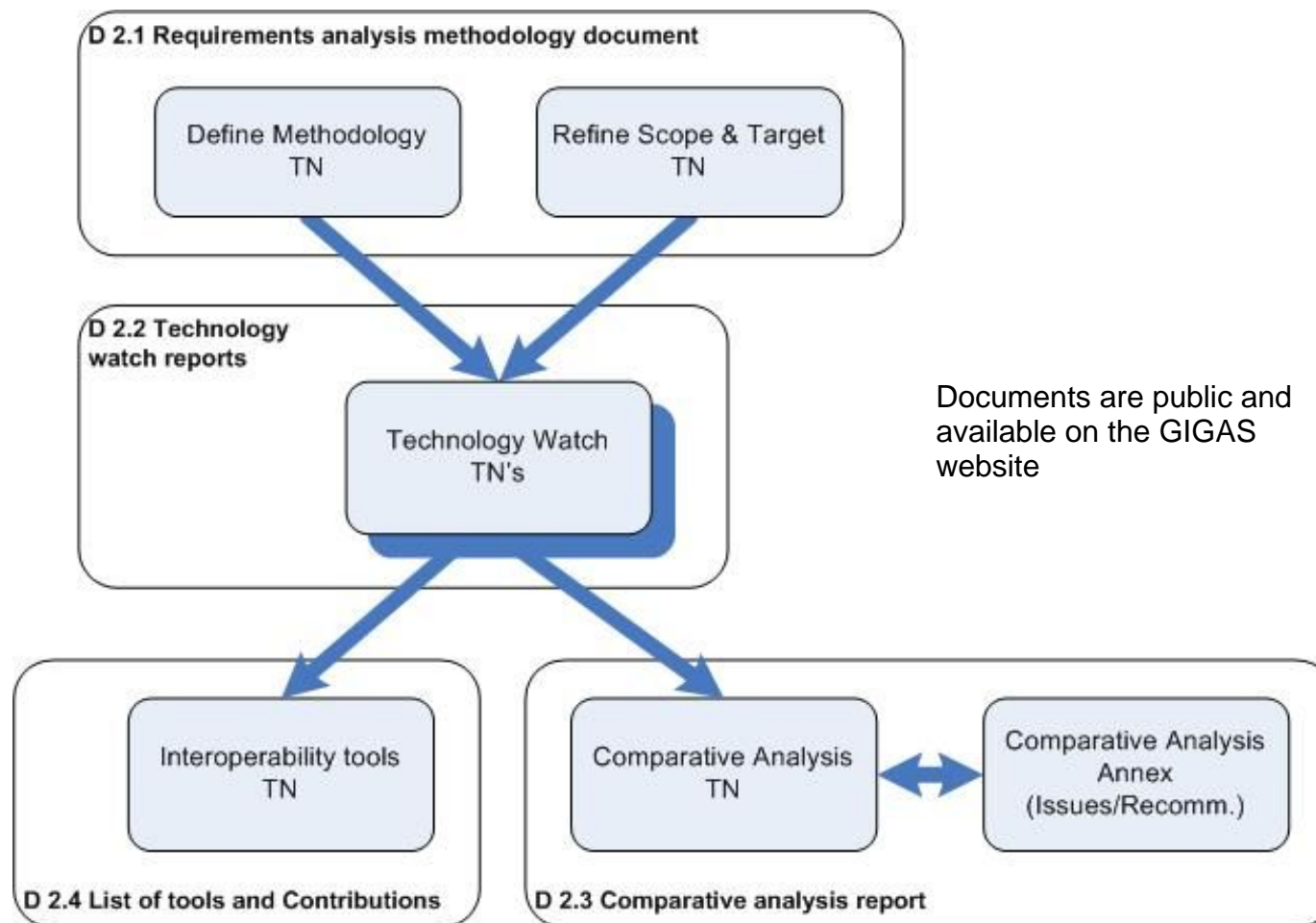
GIGAS activities are organised per **themes**

- Architecture
- Catalogue and Metadata
- Data Access and Processing
- Data Harmonisation and Semantic Interoperability
- User Management
- Cross-Initiative Scenario

GIGAS Outputs: High Level

- First step towards harmonisation
- Raise the interoperability issue among the initiatives as a key requirement in the future
- Creation of a community of stakeholders
- Setup of a process and of an infrastructure (i.e. methodology, forum, website)

GIGAS Outputs: Analysis Documents



GIGAS Outputs: Methodology

- GIGAS has developed a **RM-ODP based methodology** for **examining requirements, architectures and standards** applied on the initiatives and systems in order to provide an evaluation of them in terms of business, enterprise, information and engineering and technology architecture
- The objectives of the methodology are
 - Make the **analysis simple** with a **limited amount of resources**
 - Involve **different actors**: managers, architects, engineers, scientists
 - Deal with **components, systems and systems of systems**
 - Built independently from each other
 - Long running programmes with independent schedules

GIGAS Outputs: Methodology

- Due to the positive feedbacks coming from the use of the methodology in GIGAS a **neutral version** of the methodology has been derived
- The Neutral Methodology can be used
 - for a comparative analysis of interoperable systems or systems of systems
 - as a template for applying RM-ODP on individual systems (of systems)
- The Neutral Methodology
 - has been proposed to the teams of the GMES Services (and presented at the Open day Geoland Forum_5 in Berlin 2009)
 - has been presented to the Geo Plenary in Washington on November 2009
 - is published on the Pending Document list as OGC10- 028r1, candidate for becoming an OGC best practice document (30-day electronic vote closing on April15th 2010 **)

** Your vote is welcome if positive

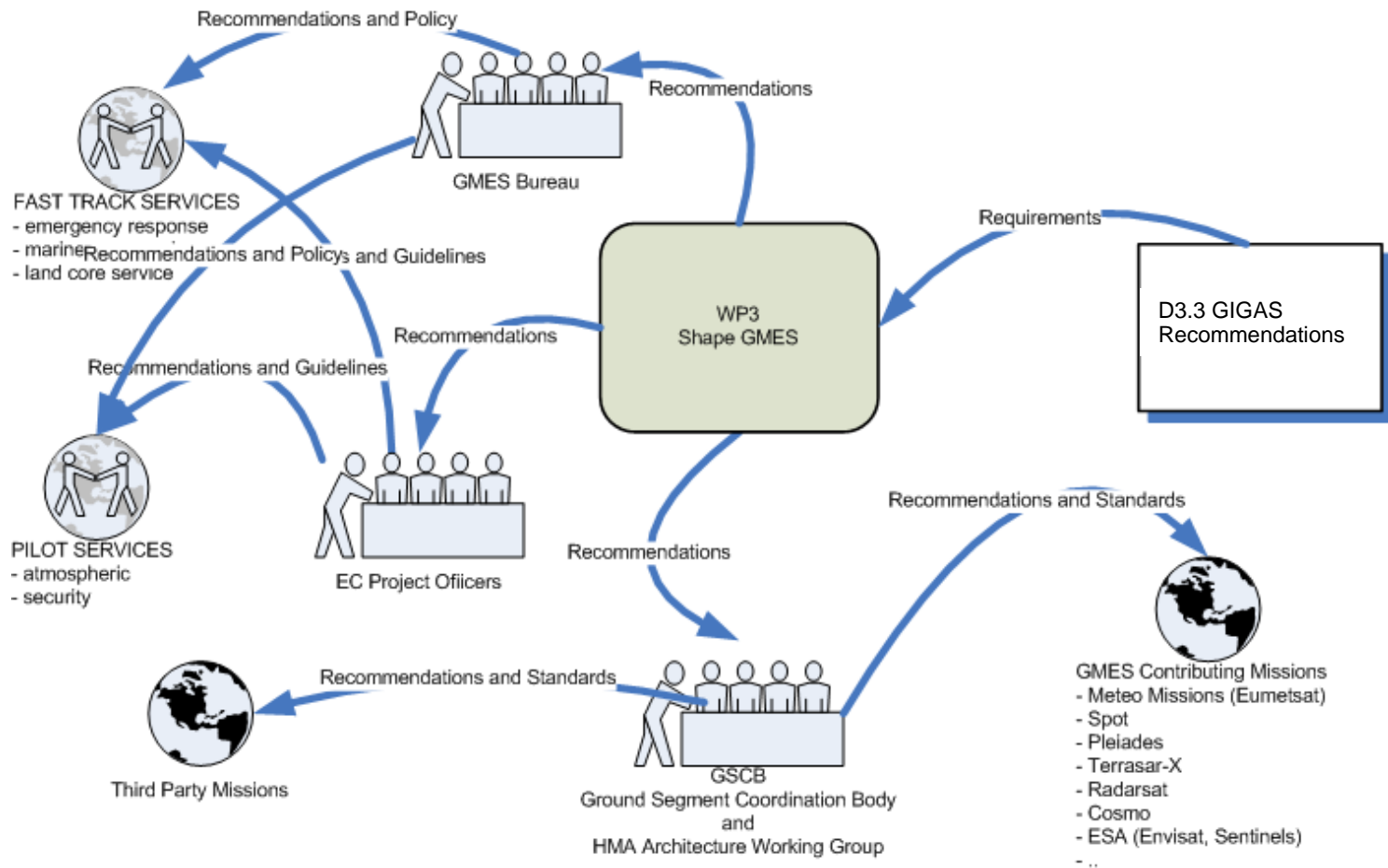
GIGAS Outputs: Recommendations & Issues

- The GIGAS Comparative Analysis result consists of a set of Recommendations and Issues for interoperability
- Recommendations
 - identify a problem,
 - provide a recommended solution
 - are addressed to specific targets
- Issues
 - identify the existence of a problem without providing a solution but addressing further investigation on the topic
- GIGAS Recommendations and Issues are published for discussion and further refinement on the GIGAS Forum (<http://www.thegigasforum.eu/forum/recommendations.html>)

GIGAS Outputs: Recommendations & Issues

Theme	N. of Recommendations	N. Of Issues
Architecture	0	5
Catalogue and Metadata	5	1
Data Access and Processing	11	2
Data Harmonisation and Semantic Interoperability	8	6
User Management	0	4
Cross-Initiative Scenario	0	4

GIGAS Shaping: GMES



GIGAS Shaping: Participation to GEOSS AIP 3

- GIGAS consortium participates to the GEOSS Architecture Implementation Pilot – Phase 3 (AIP 3) by promoting the relevant set of recommendations and issues coming from the project
- GIGAS Partners have submitted two proposals as a response to the AIP-3 CFP
 - Proposal 1: GIGAS Data Interoperability contribution
 - Proposal 2: GIGAS Disaster Scenario contribution

Architecture Results

- It is available a complete picture of the architectures of the
 - Initiatives
 - Some FP6/FP7 Projects
 - Standardisation bodies
- A common harmonised template/framework is used
- The Architecture Technology Watch TN is a valid reference for the other themes and for the GIGAS project as a whole

Architecture Results

- The Architecture Technology Watch is a basic reference for identifying high level interoperability issues (gaps and commonalities) and new areas to be tackled by GIGAS
- The Architecture Technology Watch is a valid support tool for the other themes
- Architecture study identified the needs for a deeper analysis of
 - Data harmonisation and semantic interoperability
 - Cross-initiative scenario
- The identification of a super-architecture is not in the scope of GIGAS and the raising of concrete recommendations/issues at architecture level for the initiatives is to be carefully evaluated

Architecture Table of Contents

- Initiatives
 - GEOSS
 - INSPIRE
 - GMES
 - CDS EO-DAIL
 - Geoland-2
- FP6-FP7 Projects
 - ORCHESTRA
 - SANY
 - GENESI-DR
- Standards
 - OGC
 - ISO/TC 211 and CEN/TC 287

Catalogue-Metadatas Results

- REC-CAT-001 Cross-initiative scenario
 - It is recommended to the INSPIRE, GEOSS and GMES stakeholders that they set up a cross-initiative scenario dealing with resource discovery in the context of a flooding, with cadastral data obtained from INSPIRE and Earth Observation data obtained from GMES and GEOSS
- REC-CAT-002 Mapping between discovery metadata elements
 - It is recommended to the INSPIRE, GEOSS and GMES technical teams that they establish a mapping between their discovery metadata elements
- REC-CAT-003a Service metadata (OGC)
 - It is recommended to the OGC OWS Common SWG to consider using ISO 19119 metadata for service description by including a dedicated metadata element in the service description
- REC-CAT-003b Service metadata (INSPIRE)
 - It is recommended to INSPIRE to define a standard mapping between OGC service description (Capabilities) and INSPIRE metadata and publish it as an OGC Best Practice

Catalogue-Metadata Results

- ISS-CAT-004 : ISO Application Profile and ebRIM Application Profile of CS-W
 - The main issue concerns the use of two non-interoperable solutions for the discovery of ISO 19115 and ISO 19119 metadata. At the minimum, a bridge between the ISO Application Profile and the CIM extension package should be defined. The approach for defining future discovery specifications is also an issue: should the initiatives profile the base CS-W specification for each type of resource (e.g. feature catalogues, ISO 19115-2 metadata, etc.) or should they instead define extension packages of the ebRIM Application Profile?
- REC-CAT-005 Access to other types of resources
 - It is recommended to the INSPIRE, GEOSS and GMES technical teams that they consider the requirements to set up and provide standardized access to other types of geographic resources, through standardized ebRIM extension packages
 - It is also recommended to consider the use of the OASIS RegRep standard and/or the OGC RegRep profile currently being developed for the registry services used to manage these resources

Data Access & Processing Results: WMS

- ISSUE-WMS-001 OWS SOAP Binding
 - INSPIRE Drafting Team Network Services (DT NS) has adopted SOAP 1.1 protocol binding while current on-going works of OGC Standard Working Group, especially OWS Common 1.2 SWG and WMS, tends to adopt SOAP 1.2 protocol binding. SOAP 1.1 and SOAP 1.2 are not compatible
 - INSPIRE DT NS recommends the usage of header of SOAP message to store recurring information while OGC OWS Common 1.2 SWG use only the body of the message as an envelop of a POST request. Consequently Information like language parameter is present in body part in OGC standard while store in header in INSPIRE implementing rules

- ISSUE-WMS-002 WMS Multilingualism
 - INSPIRE Drafting Team Network Services (DT NS) requirements include the support of multilingualism. Specifically, OGC WMS 1.3 standard, and more generally OWS Common 1.1 does not support language parameters

Data Access & Processing Results: WMTS

- REC-WMTS-001 Tiled View Service
 - It is recommended to GEOSS, INSPIRE and GMES project to consider OGC WMTS standard adoption for future Tiled View Service

- REC-WMTS-002 interoperable with WMS
 - It is recommended to OGC WMS 1.4 SWG to consider to guaranty the interoperability with existing Web Map Service

Data Access & Processing Results: Ordering

- REC-ORD-001 GEOSS Ordering
 - It is recommended to GEOSS pilot projects, Portal and Application Client Working Group to consider Best Practice document OGC 06-141 to implement the Ordering service

- REC-ORD-002 INSPIRE Ordering
 - It is recommended to the INSPIRE drafting teams to consider the Best Practice document OGC 06-141 for the specification of e-commerce services and electronic payment

Data Access & Processing Results: SPS

■ REC-SPS-001 Test SPS Implementations

- It is recommended to
 - GEOSS GEO AIP Group implementing pilot related to one or more Societal Benefit Area (e.g. Disaster),
 - OGC SPS WG in charge of handle change request and HMA Architecture Board in charge of opening new technical issue on the CDS GMES technical part
- To test different possible implementations between SPS 2.0, SPS EO Application profile 2.0 and a SPS RESTful based. Define possible implementation using XML to handle mapping between platforms

■ REC-SPS-002 Common Sensor Web

- It is recommended to
 - GEOSS Architecture and Data Management part,
 - GMES (both FP7 and CDS)
 - INSPIRE
- To envisage a common understanding and definition of Sensor Web

Data Access & Processing Results: WPS

- REC-WPS-001 WPS INSPIRE InvokeSD Service
 - It is recommended that the future INSPIRE guidance document on 'Invoke spatial data services Service' should consider WPS 2.0 for adoption
- REC-WPS-002 WPS INSPIRE Transformation Service
 - It is recommended that INSPIRE Guidance Documents for Transformation Services should consider defining a WPS Profile
- REC-WPS-003 WPS OGC WPS and SPS harmonization
 - It is recommended that OGC WPS 2.0 SWG should consider harmonization of WPS and SPS standards

Data Access & Processing Results: WCS & DAP

- REC-WCS-001 WCS 2.0
 - It is recommended to adopt WCS 2.0 core specification plus appropriate extensions.
 - It is recommended for GEOSS and GMES the adoption of CF-netCDF extension package for WCS

- REC-DAP-001 SOA Brokered approach
 - It is recommended to develop a SOA brokered approach (i.e. Brokering and Mediation services) to facilitate DAP service accessibility, usability and harmonization as demonstrated by the GEOSS ADC pilots

Data Harmonisation & Semantic Interoperability

- REC-DI-001 Common Foundation
 - It is recommended to INSPIRE, GMES and GEOSS to collaborate on establishing a common foundation for data specifications across the initiatives.
- REC-DI-002 Coherent thematic view
 - Where a theme / domain is relevant for multiple initiatives, it is recommended to INSPIRE, GMES and GEOSS to collaborate in the development of the relevant data specification(s)
- ISSUE-DI-003 Ontologies
 - The currently available operational technologies mainly require detailed agreements and harmonised data specifications. It would be far better, if looser approaches, e.g. based on ontologies, could be used to bridge semantic differences. This topic should be a high priority item in the research agenda. Persistent testbeds on such topics are encouraged
- ISSUE-DI-007 Education, capacity building, training
 - The architectural coherence required for cross-initiative scenarios introduces additional layers, see in particular REC-DI-001 (common foundation) above. In order to gain acceptance in the various communities and prepare them, capacity building is essential

Data Harmonisation & Semantic Interoperability

- ISSUE-DI-004 Infrastructure components
 - While spatial data is usually in a digital, processable form, the description of the data (metadata for use) often is not or only partially. Operational components are needed that facilitate the common use of data-related resources, including online access to conceptual schemas, to encoding schemas, to controlled vocabularies / code lists / glossaries, to coordinate reference systems and coordinate conversions, to portrayal rules etc. Whenever possible, such components should be shared between the initiatives to avoid duplication of efforts and incoherence.
- ISSUE-DI-005 Strategy for evolution
 - The maintenance processes for infrastructure components and the approaches to backwards compatibility need to be analysed in more detail across initiatives to identify if/how interoperability can be achieved not only at a specific point in time, but on a sustainable basis. In particular the use of registers is essential and the granularity of the managed items in the infrastructure components needs more work
- ISSUE-DI-006 Platform independence
 - The infrastructure should be designed to to outlive any particular technology, the specifications should be implementable in different technology platforms

Data Harmon. & Semantic Interoperability: O&M

- REC-OM-001 O&M thematic data specifications
 - It is recommended to include O&M in the INSPIRE Generic Conceptual Model, and strongly consider adoption of O&M within the thematic data specifications
- REC-OM-002 SOS support in INSPIRE
 - It is recommended to consider supporting the Sensor Observation Service (SOS) alongside WFS for the INSPIRE Download Service in relevant themes
- REC-OM-003 O&M Adoption in GMES in-situ
 - It is recommended to adopt O&M within an information architecture for the GMES In-Situ Observations component
- REC-OM-004 O&M GMES FTS vs INSPIRE
 - It is recommended to adopt O&M-based information models and services in concert with INSPIRE

Data Harmon. & Semantic Interoperability: O&M

- REC-OM-005 O&M GMES in-situ vs INSPIRE
 - It is recommended to coordinate the development of INSPIRE environmental (Annex II/III) data specifications and a GMES In-Situ Observations architecture
- REC-OM-006 O&M in GEOSS SIF
 - It is recommended to endorse the O&M standard
- REC-OM-007 O&M in GEOSS ADC
 - It is recommended to adopt a framework based on O&M (e.g. in tasks AR-09-02c 'Sensor Web Enablement for In-Situ Observing Network Facilitation' and AR-09-01a 'Enabling Deployment of a GEOSS Architecture')
- REC-OM-008 O&M Commercial Issues
 - It is recommended to commercial and open-source software vendors to support O&M and SOS within their product offerings

Cross-Initiative Scenario

- ISSUE-CIS-001 Datasets Naming
 - Differences in terminology for data products degrade interoperability. INSPIRE data theme activities are most comprehensive and can serve in part as a basis for data harmonization activities across initiatives. The Geoland-2 data product descriptions are precise for their specific area and could be a model of how to characterize datasets
- ISSUE-CIS-002 Service Naming
 - The Cross Initiative Scenarios TN identified a high degree of alignment of Service Taxonomies across the initiatives. Alignment of service type names will enable higher reuse of services across initiatives
- ISSUE-CIS-003 Service Use Cases
 - Use of a common set of Service Viewpoint Use Cases could benefit interoperability across initiatives
- ISSUE-CIS-004 Implementation of Scenarios in Testbeds
 - Implementation and testing of the Cross-Initiative Scenarios is suggested to be an element of the GIGAS Persistent Testing Activities.

User Management

- ISSUE-UM-001 Harmonization of ICDs for SOAP 1.1 and SOAP 1.2
 - GMES CDS, INSPIRE and GEOSS initiatives to agree and support SOAP 1.1 and SOAP 1.2 in all ICD specifications
- ISSUE-UM-002 PEP mechanism for KVP/REST architectures
 - PEP mechanism of GMES CDS does not support KVP/REST architectures
- ISSUE-UM-003 Harmonization of Services access control
 - Services access control mechanism should be harmonised for GMES CDS, INSPIRE and GEOSS initiatives
- ISSUE-UM-004 User registries available for federated access
 - Missing of a common way to make available different user registries for federated access

Thank You