VIII Jornadas Ibéricas de Infraestruturas de Dados Espaciais
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The development of cloud and web based Geospatial Data Access, Visualization and Processing Infrastructures

The experience of Deimos

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Earth Observation Applications/Data Systems
Deimos at a glance

• **Deimos mission**: to provide high-technology engineering solutions, as well as information systems, products and services of maximum quality, innovation and added-value to its customers.

• **DEIMOS** provides satellite systems including the development of turnkey operational systems for aeronautical and maritime applications, both civil and military, including UAV systems and solutions
Deimos at a glance

- SPACE is the core business of DEIMOS - launched two high resolution satellites:
  - DEIMOS-1 (High-resolution 22metre, Red, Green, NIR, 600 Km swath, 3 days revisit)
  - DEIMOS-2 (Very-high-resolution 75cm, Red, Green, Blue, NIR, 12 km swath, 150,000 km²/day)
- Offices in 4 countries in Europe: Spain, Portugal, UK and Romania
- +200 people
- +15 years of expertise
What do EO services require?

• EO based services/applications pipeline:
  – find and access the data they require
  – develop expert algorithms creating added value
  – scale up and process massive data volumes
  – visualisation and data analytics capabilities
  – link to users to assure informed decision support

Decision based on information, not on tweets!
How can we help?

• Collaborative EO support systems and services:
  – access to a wide range of geospatial data sources
  – powerful distributed processing architecture
  – EO imagery pre- and post-processing toolkits
  – complete application integration environment
  – expert service development and integration support
  – advanced visualisation and data analytics
How are we getting there?

- H2020
- 2012-2015
- 2.5 Meuros

SenSyF
SenSyF - Sentinel Synergy Framework

Gaining experience

• System
  – First European EO Big Data Platform
  – Easy access to Sentinel data for EO Service Developers
  – EO processing toolkit for cloud architecture
  – EO Service development environment
  – ICT provider agnostic
SenSyF - Sentinel Synergy Framework

Gaining experience

- **User communities**
  - 7 services covering the thematic areas of the Copernicus Services
  - Able to test system capabilities
  - Wide range of service developers needs
  - Insightful feedback on the framework
  - Hands-on experience on integrating EO services on cloud based platforms

- Monitor of Continental Fresh Water
- Arctic-Alpine Growing Season Mapping
- Soil Freezing/Thawing Products
- Spectro-Temporal Integration
- Multi-Temporal Land Cover Classification
- Agriculture Support Service
- Tools for Optical Sensor Calibration and Analisys
How are we getting there?

- **H2020**
  - 2012-2015
  - 2.5 Meuros

- **EEA Grants**
  - 2015-2017
  - 275 Keuros
SIMOcean: System for the integrated Monitoring of the Ocean

Consolidating the system

- **System**
  - Consolidate and improve EO Big Data Platform
  - Open data for Maritime services
  - Optimised EO data catalogue
  - Advanced service output visualization tool

http://catalogue.simocean.pt  
http://geoportal.simocean.pt
SIMOcean: System for the integrated Monitoring of the Ocean

Consolidating the system

- **User communities**
  - Experience on open data standardization - INSPIRE
  - 3 services generating added value from open data
  - Further integration of heterogeneous applications
  - Involvement of end users in services development
How are we getting there?

- **SenSyF**
  - H2020
  - 2012-2015

- **SIMOcean**
  - EEA Grants
  - 2015-2017

- **Co-ReSyF**
  - H2020
  - 2016-2018
From research to service

- **System**
  - Collaborative platform to share and reproduce knowledge and results
  - Easy data discovery, packaging and application deployment
  - Community toolkit repository
  - Metadata models for data, processing components and workflows
  - Processing chain composition
  - Knowledge support systems for non-expert users

Co-ReSyF: Coastal Waters Research Synergy Framework

http://www.coresyf.eu

http://geoportal.coresyf.eu
Co-ReSyF: Coastal Waters Research Synergy Framework

From research to service

- **User communities**
  - 6 coastal related Research Applications brought by consortium partners
  - Bringing in new researchers to EO: Call for Ideas and Summer – 8 new applications
  - Researchers using the platform are users, beta testers and contributors
  - Creating an EO coastal research community more aware of the capabilities of EO that can use or create knowledge, tools and applications
How are we getting there?

- **SenSyF**
  - H2020
  - 2012-2015
  - 2.5 Meuros

- **SIMOcean**
  - EEA Grants
  - 2015-2017
  - 275 Keuros

- **Co-ReSyF**
  - H2020
  - 2016-2018
  - 3 Meuros

- **NextGEOSS**
  - H2020
  - 2016-2020
  - 10 Meuros
**NextGEOSS: Next Generation Technologies for GEOSS**

**Standardizing and scaling up**

- **Large collaborative project – 27 partners**
- **System**
  - European GEOSS data hub for access to key EO datasets
  - Connected to wide pool of ICT resources
  - Advanced data discovery and analytics
  - User feedback mechanism
  - Quality of Service
  - Service Support Desk
  - OGC interface standards compliance
  - Complete process for pilots integration

[http://www.nextgeoss.eu](http://www.nextgeoss.eu)
NextGEOSS: Next Generation Technologies for GEOSS

Standardizing and scaling up

• Pilots
  – Focus on addressing Sustainable Development Goals
  – Several readiness levels and diverse needs putting requirements on system
  – Test system to unprecedented scale
  – Provide opportunity to scale up operations
  – Bring their own user communities
NextGEOSS: Next Generation Technologies for GEOSS

Innovative Pilots

IP1 Agricultural Monitoring

IP2 Biodiversity

IP3 Space & Security

IP4 Cold Regions

IP5 Air Pollution in Mega Cities

IP6 Disaster Risk Reduction

Business Pilots

BP1 Territorial Planning

BP2 Food Security

BP3 Smart Cities

BP4.1/2 Energy*
Where do we go from here?

- EO systems and services should be developed in close collaboration between:
  - System developers
  - Value added service developers
  - End users and decision makers

- Use of standards is key for interoperability:
  - be agnostic to ICT providers
  - provide common interfaces for components developed by different institutions
  - reach a wider range of service developers and end users

- Other key aspects:
  - easy access to a wide range of EO and non-EO data
  - flexible and scalable ICT resources
  - easy service integration process
Where do we go from here?

• Deimos focused on creating a comprehensive ecosystem that:
  – provides access to wide range of EO data (Level 1 and 2 and also higher level)
  – connection to any ICT provider providing flexible and scalable resource allocation
  – provides easy integration of new services with expert guidance
  – provides standard interfaces between different system components and to external users
  – fosters the entry of new service developers
  – fosters the link between service developers and end user/decision makers
Thank you!

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