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EOPEN – AN INTEROPERABLE PLATFORM

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Overview

- Why do we need interoperability ?
- Why has interoperability become important?
- What is the impact of the lack of interoperability?
- Levels of interoperability addressed by EOPEN
- How EOPEN supports interoperability

Why do we need interoperability?

- Unless this is your sport you will not like obstacles.
- They slow you down and prevent you from performing optimally.

- Interoperability is about removing obstacles to facilitate the exchange information between applications, databases, and other computer systems.
- **The easier the better.**

Picture curtesy https://www.active.com

Why has interoperability become important?

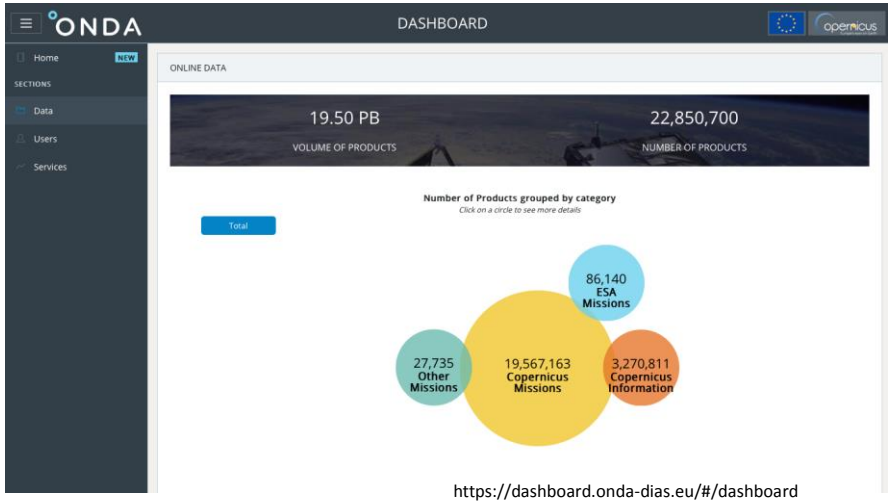
- In less than 5 years we have gone from searching to find data to being overwhelmed with data.
- In 2018 there were 684 satellites with EO purpose compared with 192 in 2014.
- The European Union is paying for the Sentinel satellites, part of the Copernicus programme to deliver data and services. The data is free to access. Now exceeding 19.48 PB of data.
- **The challenge is to make use of the data for social, environmental and commercial purposes.**

What do Earth observation satellites do?

Whilst the 684 satellites we are looking at today have a purpose of EO or Earth Science, there are further details on their specific roles. So we have:

- Optical Imaging: 338 satellites.
- Radar imaging: 49 satellites.
- Infrared imaging: 8 satellites.
- Hyperspectral/Multispectral imaging: 10 satellites.
- Meteorology: 82 satellites.
- Earth Science: 62 satellites.
- Electronic intelligence: 64 satellites.
- Video: 2 satellites.
- Other purposes: 12 satellites.
- 57 satellites simply list EO as their purpose.

Source: https://www.pixalytics.com/eo-satellites-in-space-2018/



https://dashboard.onda-dias.eu/#/dashboard

What is the impact of the lack of interoperability?

- Data is difficult to find
- It cannot be easily accessed (syntactic interoperability)
- We may not know how to use the data or the algorithms (semantic operability)
- We need experts to interpret data and develop applications
- Platforms hosting the data are complex and require teams of ICT specialists to build our applications
- It takes time to develop, integrate and bring the application/service to market
- Once developed the applications are difficult to change (technology legacy)
- You are the integrator, especially if you want to include heterogenous data sources, e.g social media data

Levels of interoperability addressed by EOPEN

- **User Level**
  - Make it possible to share results and use commonly needed processing components developed by EOPEN IT and science teams [EOPEN Extensions]
  - Common approach to build workflows encouraging interoperability [EOPEN Core]
- **Machine to Machine**
  - Adoption of popular standards to find, access and use data [OGC]
  - Unified approach for EOPEN users hiding different implementations of application programming interfaces [Interoperability Layer]
  - Automation of packaging of user provided modules to have a common, consistent interface [Web services]
- **Data**
  - Data typing enforcement to guarantee availability of metadata and valid workflow definitions

GOAL : Create an OPEN, EASY TO USE and INTEROPERABLE PLATFORM

How EOPEN supports interoperability

- EOPEN allows teams and teams of teams to work together. → Collaboration and sharing of assets
- It is designed to be platform and applications agnostic. → No hidden knowledge
- It supports machine to machine interfaces. → An interoperability layer provides a unified means to communicate
- Its graphical, intuitive and designed for low coding effort. → You do not have to be an IT expert
- Heterogenous sources of data and processing resources can be integrated into one workflow. → Access and process the data where it best suits you
- Open to other platforms. → Built on commonly used open source products and applies OGC standards
- Experts have built functionality to support developing your processes. → Support to get you started

What EOPEN demonstrates

- An integrated environment in one platform to develop and support the development of services involving data providers, processing resources, the scientific community, the downstream services community and end user stakeholders.
- Access and use of multiple platforms (5 Copernicus Data Access and Information Services) and High Performance Computing.
- 3 use cases in separate domains, Flood Management, Climate Change Impact and Food Security.
- Use of social media data in combination with Earth Observation data.
- Advanced processing technologies such as Machine Learning.

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Thanks

Any questions?

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