The Water SWITCH-ON, Spatial Information Platform (SIP)

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Project context

Software requirements
- Design principles
- Agile software development approach
- Component and layer driven development

Software architecture
- Components and relationships
- Components and functionalities
- BYOD (Browse Your Open Dataset)
- ODR (Open Data Registration) tool
- REST interfaces and Catalogue
- SIP Expert tool
- Catalogue and data model

Documentation and code

Conclusions
PROJECT CONTEXT

- SWITCH-ON is a project using Open Data as a vehicle for innovations, with the aim to use water resources in a sustainable way for a safe society and to advance hydrological sciences.
- We are building bridges between policy makers, water managers, information producers and scientists.
- EU research project running Nov 2013 – Oct 2017 within the FP7.
- 15 collaborating partners (5 Universities, 2 Governmental institutes, 8 SMEs).

www.water-switch-on.eu
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Design principles

“As hydrological modeller, I would like to find different data types (like meteo and discharge), which are spatially correlated (in other words, in the same catchment), so I can directly see if all the data for my model is available.”

Remko Nijzink (TU Delft)

- Main search/discovery/access objectives and design principles:
  - Spatial search for water-related datasets (Polygons work better than simple bounding boxes).
  - License-based search and terms of use per dataset.
  - Combined keywords search both free-text, generic (INSPIRE topic categories) and domain specific (X-CUAHSI keywords, hydrologic ontology).
  - Access should be directly accessible (no registration) and links should be verified.
  - Catalogue of datasets should be harvestable by other big projects such as GEOSS.
Agile Software development approach

- Correcting an initial IT development approach based on existing GIS tools within the consortium.

- **User story** driven development via GitHub issues (iterative process, refinement).

- **Use cases** written by scientists, technical solution led by IT professionals.

- Interactive sessions with both **developers** and **scientists** led to better Graphical User Interfaces.
Component and layer driven development

- Divide and conquer approach: Multiple software components communicating via REST services.
- Metadata ISO standards + OGC protocols used to serve external services and catalogues.
- Components divided in 3 layers (Data/Storage, Service/API, GUI/Client)
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Components and relationships

SWITCH-ON is an EU FP7 Collaborative project (grant agreement No. 603587) under the Environment programme running from November 2013-October 2017.
## Components and functionalities

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BYOD (Browse your open dataset) – Map view

Free text search

Search Results

Spatial Preview

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BYOD (Browse your open dataset) – List view

Selected keywords

Keyword groups

Data origin

License

Access
ODR (Open Data Registration) tool - Upload

Data Upload Tool

If you like to upload shapefiles, please zip (with a .zip extension) the shapefile before uploading. The tool will automatically create web services (WMS and WFS) for mapping and accessing the shapefile, as well as enabling a spatial search of the dataset. A dataset can contain only one zipped shapefile.

For netCDF files, the tool will offer OpenDAP web services for access. You can upload multiple netCDF files.

Open-Data Registration Tool

Please provide a brief narrative summary of the content of the dataset. Use between 100 and 500 words.

Dataset Description

Name: Paulaina Polder DEM

Link to Information: http://rd-eg003.xt.del.uns/nisara/paulina_polder_dem

Description: Digital Elevation Model (DEM) of the Paulaina Polder Area in the Netherlands. The dataset has been produced from LiDAR data obtained during a 2016 survey.

Keywords: Land cover, Land management, Soil depth, Geoip

INSPIRE conference 2017, September 6-8, 2017, Strasbourg, France

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The **OpenAIRE** project, in the vanguard of the open access and open data movements in Europe was commissioned by the EC to support their nascent Open Data policy by providing a catch-all repository for EC funded research.

**DOI (Digital Object Identifier)**
ODR (Open Data Registration) tool - Describe

**Geolocation options**

**License conditions**
SIP Expert tool

- Data management tool used by project administrators users only.
- Extended metadata editing capabilities (ex: delete datasets).
- Desktop tool with GIS capabilities and data visualization and validation.
Catalogue and data model

- **Data** stored in Geoserver, Thredds, depending on the data type.

- **Metadata** Information stored in a Relational Database (PostGIS).

- Information fields can be easily mapped to standards such as ISO 19115.

- Simple CSW client instance configured to enable easy access to the catalogue.
Aim: To gain more visibility/exposure of the project datasets.

OGC/CSW protocol and ISO 19115 metadata facilitates the exchange.
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Documentation (video tutorials)

https://www.youtube.com/channel/UCNbBe7iT_HRekm3yFzui2g
Open Source code (GitHub)

https://github.com/switchonproject

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- SWITCH-ON architecture is divided in several OGC compliant components instead of a single entity.
- The agile development approach was very successful.
- SWITCH-ON uses both CUAHSI keywords (extended) and INSPIRE topic categories to tag uploaded open data.
- Zenodo API allows users to make their data/work citeable (DOIs).
- Thanks to the usage of OGC/CSW protocol the datasets are harvestable by bigger catalogues such as the GEOSS system of systems.
- Code is open-source and available through GitHub
- There is documentation and online howto videos on the switch-ON Youtube channel
Thank you!

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