Organization and implementation of an INSPIRE registry in France
Etienne Taffoureau

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Organization and implementation of an INSPIRE registry in France

Etienne Taffoureau, BRGM
Outline

> Framework
> Organization and methodology for implementing a French Registry
> An example of BRGM register
> The BRGM approach to registry implementation
> Re3gistry & UKGovLD features
> Conclusions & perspectives
Framework

> Article 10 of the Directive requires that Member States ensure that any information, including data, codes and technical classifications, needed for compliance with the Directive are made available to public authorities or third parties.

> Delivery against this article is being achieved through the creation of a French Registry within geocatalogue.fr. This will provide Data Publishers with access to code lists and other reference data and schemas required at a FR level and not located at other sources, e.g. the EC INSPIRE geoportal.

> INSPIRE includes only one legal obligation related to registers: extensions by data providers of the code lists mandated in Commission Regulation (EU) No 1089/2010 on interoperability of spatial data sets and services need to be published in registers.

> However, MS and thematic communities are setting up registers for other purposes as well, e.g. to have a single repository of all organizations in a MS responsible for implementing INSPIRE, including their unique identifiers. In general, registers are useful in all situations where, by a reference code rather than free text, in data exchange, ambiguities or inconsistencies can be avoided. Also registers can facilitate the internationalization of user interfaces by providing multilingual labels.
Organization and methodology for implementing a French Registry
Organization for implementing a French Registry

INSPIRE Themes
- Geology
- Mineral resources
- Hydrography

Data providers
- brgm.fr
- eaufrance.fr

FR coordination unit
- National Registry
  geocatalogue.fr

European commission
- INSPIRE Registry
- Codelists
- Organizations
- Themes
- ...

INSPIRE Conference, Strasbourg, 2017-09-06
Methodology for implementing of a French registry

> Identification of priority themes:
  • Utility and Government Services
  • Land Use & Land cover
  • Area management/restriction/regulation zones and reporting units
  • Biodiversity themes: Habitats and Biotopes, Species Distribution, Bio-geographical Regions
  • Geology, Mineral resources, Natural risk zones, Hydrography, environmental monitoring facility, Production and Industrial Facilities, Agricultural and Aquaculture Facilities

> Identification of a workflow and methods (eg. for designing URI) for managing registers

> Test of registry opensource softwares (work in progress!):
  • Re3gistry (https://joinup.ec.europa.eu/software/re3gistry)
  • UKGovLD (https://github.com/UKGovLD)

> Publication of the registry in a beta version (by the end of 2017)

> Set up of registers for extended INSPIRE code lists and link to the central INSPIRE code list register
An example of BRGM register
Example: Description of boreholes

Lithology = lithology1 + lithology2 + colour + component + qualifier

Code list register

Code lists

Code list values

- Lithology
  - Carbonated rock
  - Granit
  - Leucogranit
- Colour
- Component
- Qualifier

Boreholes
BRGM registry : code list register

<table>
<thead>
<tr>
<th>Code list register</th>
<th>ID:</th>
<th><a href="http://registry.brgm-rec.fr/codelist">http://registry.brgm-rec.fr/codelist</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Label:</td>
<td></td>
<td>code list register</td>
</tr>
<tr>
<td>Content Summary:</td>
<td></td>
<td>The code list register contains the code lists and their values.</td>
</tr>
<tr>
<td>Owner:</td>
<td></td>
<td>BRGM</td>
</tr>
<tr>
<td>Register manager:</td>
<td></td>
<td>BRGM</td>
</tr>
<tr>
<td>Control body:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submitter:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact point:</td>
<td></td>
<td>Contact BRGM</td>
</tr>
<tr>
<td>Licence:</td>
<td></td>
<td>Non applicable</td>
</tr>
<tr>
<td>Other formats:</td>
<td></td>
<td>XML, XML (ISO 19135), RDF/XML, JSON, Atom, CSV</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code Lists</th>
<th>Filter Label</th>
<th>Filter Themes</th>
<th>Filter Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label</td>
<td>Label</td>
<td>Themes</td>
<td>Status</td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Composant</td>
<td></td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Deposit class</td>
<td></td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Glotology</td>
<td></td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Lithology</td>
<td></td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Lithostratigraphy</td>
<td></td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Morphology</td>
<td></td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Qualifiant</td>
<td></td>
<td></td>
<td>Valid</td>
</tr>
</tbody>
</table>

INSPIRE Conference, Strasbourg, 2017-09-06
The BRGM approach to registry implementation
Best practices for registers & registries


- 1/ Use well defined roles, responsibilities and procedures for register management
- 2/ Use resolvable URIs (HTTP-URIs) as identifiers for registers and register items
- 3/ Use item classes
- 4/ Use well-defined statuses
- 5/ Do not delete items
- 6/ Provide registers in different formats
- 7/ Use content negotiation for serving registers available in multiple formats
- 8/ Provide registers in different languages

INSPIRE Conference, Strasbourg, 2017-09-06
Best practice 1: Use well defined roles, responsibilities and procedures for register management

The roles and responsibilities are defined in [ISO 19135-1] :

- **Register owner**: a register owner is an organization that has established one or more registers, and has primary responsibility for the management, dissemination and intellectual content of those registers.
- **Register manager**: a register owner may delegate the role of register manager to another organization. A register manager may manage multiple registers.
- **Submitting organizations**: a submitting organization is an organization that is qualified under criteria determined by the register owner to propose changes to the content of a register.
- **Control body**: a control body is a group of technical experts appointed by a register owner to decide on the acceptability of proposals for changes to the content of a register. A control body may not be required for simple registers.
- **Registry manager**: a registry manager is a person or an organization responsible for the day-to-day management of a registry. A register manager may engage a third-party service provider to perform this service.
- **Register user**: Register users access a registry in order to use one or more of the registers held in that registry. Register users include any person or organization interested in accessing or influencing the content of a register.
Roles, responsibilities and procedures for BRGM register management

code list register

ID: http://registry.brgm-rec.fr/codelist

Label: code list register

Content Summary: The code list register contains the code lists and their values.

Owner: BRGM
Register manager: BRGM
Control body: 
Submitter: 

Contact point: Contact BRGM
Licence: Non applicable

Other formats: XML, RDF/XML, JSON, Atom, CSV

Code Lists

<table>
<thead>
<tr>
<th>Filter Label</th>
<th>Filter Themes</th>
<th>Filter Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Composant</td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Deposit class</td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Gtology</td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Lithology</td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Lithostratigraphy</td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Morphology</td>
<td></td>
<td>Valid</td>
</tr>
<tr>
<td>Qualifiant</td>
<td></td>
<td>Valid</td>
</tr>
</tbody>
</table>

Items per page: 50, Showing 1 to 6 of 6 entries
Best practice 2: Use resolvable URIs (HTTP-URIs) as identifiers for registers and register items

> The EU INSPIRE Directive calls for “a common framework for the unique identification of spatial objects, to which identifiers under national systems can be mapped in order to ensure interoperability between them”

> The codelist register is identified by the following HTTP URI: http://resource.brgm.fr/registry/codelist

> The register item “lithology” in the codelist register is identified by the following HTTP URI: http://resource.brgm.fr/registry/codelist/lithologie

> The register item “clay” in the codelist register is identified by the following HTTP URI: http://resource.brgm.fr/registry/codelist/lithology/SE024

> Beyond the register requirements, a procedure for managing URI (to reference datasets, scientific publications, …) is being created for BRGM
Best practice 3: Use item classes

As the hierarchical INSPIRE register BRGM code list register contains two item classes, each with its own specific attributes:

• Code list (containing e.g. information about the extensibility)
• Code list value
• Each codelist value can be associated with other values
Best practice 4: Use well-defined statuses

The INSPIRE registry uses the following status values:

- **submitted**: The item has been entered into the register, but the control body has not accepted the proposal to add it.
- **valid**: The item has been accepted, is recommended for use, and has not been superseded or retired.
- **invalid**: A decision has been made that a previously valid register item contains a substantial error and is invalid, and will normally have been replaced by a corrected item.
- **retired**: A decision has been made that the item is no longer recommended for use. It has not been superseded by another item.
- **superseded**: The item has been superseded by another item and is no longer recommended for use.
Best practice 4: Use well-defined statuses

UKgovLD status schema
## Best practice 4: Use well-defined statuses

<table>
<thead>
<tr>
<th>UKGovLD</th>
<th>Re3gistry</th>
<th>ISO 19135</th>
</tr>
</thead>
<tbody>
<tr>
<td>notAccepted</td>
<td>-</td>
<td>notValid</td>
</tr>
<tr>
<td>submitted</td>
<td>submitted</td>
<td>submitted</td>
</tr>
<tr>
<td>reserved</td>
<td>-</td>
<td>flags a reserved entry, same semantics as submitted</td>
</tr>
<tr>
<td>invalid</td>
<td>invalid</td>
<td>invalid</td>
</tr>
<tr>
<td>accepted</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>valid</td>
<td>valid</td>
<td>-</td>
</tr>
<tr>
<td>experimental</td>
<td>-</td>
<td>the item is being trialed and might be withdrawn or replaced</td>
</tr>
<tr>
<td>stable</td>
<td>-</td>
<td>no change is currently anticipated</td>
</tr>
<tr>
<td>deprecated</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>superseded</td>
<td>superseded</td>
<td>superseded</td>
</tr>
<tr>
<td>retired</td>
<td>retired</td>
<td>retired</td>
</tr>
</tbody>
</table>
Best practice 5: Do not delete items

> Instead of deleting items, a status that states the element as *retired* or *invalidated* shall be used (see previous slide)
Best practice 6: Provide registers in different formats

URL: http://registry.brgm-rec.fr/ukgovld/codelist/lithologie

UKGovLD

Download formats available:
- RDF ttl: plain, with metadata
- RDF/XML: plain, with metadata
- JSON-LD: plain, with metadata
- CSV: plain, with metadata
- Export all: export

... currently empty

Validé

Validé

Validé

Validé

Validé

Validé

Validé

RESULTATS PAR PAGE: 50

MONTRER 1 À 8 DE 8 RÉSULTATS

Core metadata
Reg metadata
All properties

Download

Developed by Epimorphics Ltd
Best practice 7: Use content negotiation for serving registers available in multiple formats

Both Re3gistry and UKGovLD softwares support content-negotiation. Different representations of the items can be served according to the content type specified in the Accept: header of the HTTP Request.

The example below shows the call to the same resource with two different formats (RDF/XML and RDF/ttl).

• GET http://registry.brgm-rec.fr/codelist/lithologie
  HTTP/1.1 Accept: application/rdf+xml

• GET http://registry.brgm-rec.fr/ukgovld/codelist/_lithologie
  HTTP/1.1 Accept: application/turtle+xml
Best practice 8: Provide registers in different languages

The registry system provides the information in multiple languages:

- It depends on the language of the user interface
- Default language is French
- Some code list values are available in English, e.g., the morphology code list ("mineral resources" INSPIRE theme)

<table>
<thead>
<tr>
<th>ID</th>
<th>PERE</th>
<th>FRANÇAIS</th>
<th>ANGLAIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>Corps minéralisé primaire concordant à sub-concordant</td>
<td>Concordant to subconcordant primary orebody</td>
</tr>
<tr>
<td>A10</td>
<td>A</td>
<td>Couche</td>
<td>Bed</td>
</tr>
<tr>
<td>A11</td>
<td>A10</td>
<td>Couche stratiforme : mono ou multi-couches (syn-encaisissant)</td>
<td>Stratiform bed: single or multi-layered (syn-depositional with host rock)</td>
</tr>
<tr>
<td>A12</td>
<td>A10</td>
<td>Couche stratoïde (mono ou multi-couches)</td>
<td>Stratabound bed (single or multi-layered)</td>
</tr>
<tr>
<td>A20</td>
<td>A</td>
<td>Amas, lentille, pod concordant à sub-concordant de minéral massif à sub-massif</td>
<td>Concordant to subconcordant mass, lens or pod of massive to submassive ore</td>
</tr>
<tr>
<td>A21</td>
<td>A20</td>
<td>Amas et lentille stratiformes (syn-encaisissant) de minéral massif à sub-massif</td>
<td>Stratiform mass or lens of massive to submassive ore (syn-depositional with host rock)</td>
</tr>
<tr>
<td>A22</td>
<td>A20</td>
<td>Amas et lentille sub-concords ou stratoïdes (stratabound) de minéral massif à sub-massif</td>
<td>Subconcordant or stratabound mass or lens of massive to submassive ore</td>
</tr>
<tr>
<td>A23</td>
<td>A20</td>
<td>Pod, corps podiforme</td>
<td>Pod, pod-shaped body</td>
</tr>
</tbody>
</table>
Re3gistry & UKGovLD features
<table>
<thead>
<tr>
<th></th>
<th>Re3gistry v1.3</th>
<th>UKGovLD v1.2</th>
</tr>
</thead>
</table>
| Installation / configuration | Complex architecture  
Several components to install  
Not easy in a specific configuration | Easy to install and configure                                                                 |
| Customization (formats & registers) | Flexible (via transformation files, underlying model)  
Not trivial | Flexible (based on linked-data principles)  
Not trivial                                                                 |
| Customization (UI) | Not tested | Not tested |
No user guide for the UI | [https://github.com/UKGovLD/registry-core/wiki](https://github.com/UKGovLD/registry-core/wiki)  
No user guide for the UI |
| Editing UI | No (v2.0) | Yes |
| Import formats | CSV | RDF |
| Authentication method | ECAS, SHIRO | SHIRO, Google account |
| Export formats | XML (Re3gistry), RDF/XML, JSON, XML (ISO 19135), Atom, CSV | RDF turtle, RDF/XML, JSON, CSV |
| API | Read-only | Read / write |
| Content negotiation | Yes | Yes |
| Search engine | Solr | Solr |
| Performance | Not tested | Not tested |
| Security | Acunetix tests in progress  
Solr (v4.8) directly available by the client | Acunetix tests in progress |

INSPIRE Conference, Strasbourg, 2017-09-06
Conclusions & perspectives

> Code lists and organizations registers have already been implemented

> Re3gistry and UKGovLD softwares have been tested:
  • Both respond to need of publishing INSPIRE code lists
  • The CSV format is useful for importing data (UKGovLD needs a converter tool) but an editing mode is needful
  • They have common output formats (eg. XML/RDF) but the syntax is different
  • UKGovLD seems to be more adapted for a linked-data approach

> The challenge is to set up of registers for extended INSPIRE code lists and link to the central INSPIRE code list register: harvest or reference scenario?

> A publication of a french registry in a beta version is expected by the end of 2017. To be continued…
Thank you for your attention!

Etienne Taffoureau, BRGM