

Increasing FAIRness by sustainable modelling of interactions of parties with land administration systems

> Saša Vranić, PhD assist. prof. Hrvoje Matijević prof. Miodrag Roić prof. Vlado Cetl

#### Overview

- Introduce interactions into LADM
- FAIR data
- Extending LADM to support interactions
- Technological developments
- OGC API
- Example implementation with OGC API

#### Interactions with LAS

- Types of interactions
  - Data manipulation (Creating/Updating/Deleting)
  - Retrieval of raw data
  - Retrieval of processed data (i.e. extracting information from the data)
- Further classification of interactions
  - Read-write
    - Data manipulation (Creating/Updating/Deleting)
  - Read-only
    - Retrieval of raw data
    - Retrieval of processed data (extracting information from the data)



# Extending LADM to support interactions – as is

- Vranić et al (2018) added the association between LA\_SpatialUnit and LA\_Source
- LADM Edition II generalizes this approach and added the association between LA\_Source and VersionedObject
- All other LADM classes inherit this association as a descendant of the class VersionedObject
- Here lies the challenge we are trying to address



Extending LADM to support interactions – proposed model

- LA\_Source as a descendant of the class LA\_Interaction
- New association between the class VersionedObject and LA\_Interaction



# Technological introduction





### OGC API

- Built on top of legacy OGC WxS standards
- resource-centric APIs
  - adopting the modern web development practices
  - not making references to any of existing web technologies
- Some of OGC API standards:
  - Features (ex WFS),
  - Maps (ex WMS),
  - Processes (ex WPS),
  - Coverages (ex WCS),
  - Records (ex CSW)
- Requirement classes
  - Core (mandatory, does not mandate a specific encoding or format)
  - HTML,
  - GeoJSON,
  - Geography Markup Language (GML), Simple Features Profile, Level 0
  - Geography Markup Language (GML), Simple Features Profile, Level 2

# Implementing interactions with OGC API

- Geoportals usual way of making available processed data retrieval interaction to the general public
  - Complex and expensive to implement and maintain
- Geospatial services implemented to make available both raw and processed data retrieval interactions
- OGC API based services
  - Simple hierarchical structure of API endpoints
  - Datasets published as collections (e.g. parcels in JSON, GML, etc.)



# Implementing interactions with OGC API example

Conta
json jsor
information: http://example.org

#### Items in this collection.

Next



Id	scaterank	name	name_atc
0	0	Lake Baikal	https://en.wiki
1	0	Lake Winnipeg	https://en.wiki
2	0	Great Slave Lake	https://en.wiki
3	0	L. Ontario	https://en.wiki
4	0	L. Erie	https://en.wiki
5	0	Lake Superior	https://en.wiki
6	0	Lake Victoria	https://en.wiki
7	0	Lake Ladoga	https://en.wiki
8	0	Balqash Köli	Lake Balkhash
9	0	Lake Tanganyika	https://en.wiki

GET /collections/cadastral\_parcels/queryables Get Cadastral Parcels queryables

certified-map A process which returns a digitally signed cadastral map in a PDF format.

GET /processes/certified-map Get process metadata

- POST /processes/certified-map/execution Process Hello World execution
- GET /processes/certified-map/jobs Retrieve job list for process

# Conclusion

- Overall aim of this paper
  - generic framework for modelling interactions which can be specialized further in any LAS
- OGC API provide a modern means for standard-based dissemination of LAS data, i.e. implementing interactions
- Simpler methods for using and exploiting datasets
- OGC API is compatible with LADM
- Interactions can be easily introduced in LADM Edition II
- OGC API is in the process of creation (LADM as well)
- We should participate in OGC hackathons and other activities
  - Promote LAS domain
  - Increase the applicability of OGC API within LAS

Increasing FAIRness by sustainable modelling of interactions of parties with land administration systems

> Saša Vranić, PhD assist. prof. Hrvoje Matijević prof. Miodrag Roić prof. Vlado Cetl

#### Thank you! Questions?