Estonian e-Cadastre as basis for efficient land management

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Scope of data

Cadastral parcels (as of October 2017)

✓ 693 026 cadastral parcels, i.e. 98.5% of Estonian land is registered in the cadastre
✓ Over 697 000 items in the cadastral archive – of them about 2/3 are partially scanned

Objects causing restrictions and zones of restrictions

✓ Over 63 000 km² of area objects (e.g. protected area, mineral deposit, etc)
✓ Over 164 000 km of line objects (e.g. lines, roads, etc)
✓ Over 123 000 of point objects (e.g. single objects of nature or heritage conservation)

Administrative boundaries

15 County; 79 Municipality; 4671 Settlement area

Estonian Republic
Area: 45 339 km²
Data content of the cadastral unit

Cadastral register includes:

- the cadastral register number
- the proximate address;
- the date of registration in the cadastre;
- the date of registration in the land register;
- the intended use;
- the total area;
- the area by land cover
- the assessed value
- the data pertaining to boundary points / Spatial data in rectangular coordinate system L-EST97
New software was implemented at the beginning of 2014.

It was made by Estonian IT company Datel.

Goal: from everywhere accessible web interface.
e-Cadastre functional specifications

✓ Cadastral software must be created using mostly open-sourced expandable software
✓ Identifying clients based on ID-card or Mobile-ID and able to store digital signatures
✓ Ready for 3D spatial data storing and representation
✓ Digital archive are able to store full cycles digital life of electronic documents

User friendly and customizable settings
e-Cadastre technical specifications

- There are three independent servers in the server cluster what includes:
  - Load splitter
  - e-Cadastre applications
  - Web GIS applications

- Database level: Oracle11g Oracle Spatial, Oracle Topology, CentOS Linux.

- Applications server level: Java J2EE, apache Tapestry 5.3, Tomcat 7, MapServer

- Methodology:
  - SSL protocol for data traffic
  - Database is incremental
  - All feature include creator information

- Client applications: HTML5, Ajax, Javascript, OpenLayers

- e-Cadastre system downtime 2 hours weekly
e-Cadastre workbench

☑ Virtual office for surveyors
☑ Procedure module for cadastral registrar
☑ Map
☑ Digital archive managing all cadastral digital files
☑ Statistical module for managing cadastral
☑ Administration module for managing user rights and software settings

All in one interface web solution
Cadastral Web Map services

Depending of the data, there are couple of URL-s

http://kaart.maaamet.ee/wms/alus?
Cadastral data
Administrative and Settlement Division
Restrictions
Estonian Basic Map (color and monochrome)
Orthophotos (including NGR photo layer used in forestry)
Soil Map
Corine land cover

http://kaart.maaamet.ee/wms/fotokaart?
several orthophoto issues layers

http://kaart.maaamet.ee/wms/ajalooline?
historical maps layers
Cadastral web map application

Estonian Land Board’s Geoportal [http://geoportaal.maaamet.ee/eng](http://geoportaal.maaamet.ee/eng)

There are several Map Applications

- The user can choose between four different types of background maps
- Queries by parcel identifier, village name, land register unit number…
Signed license policy and contract of using data by authorities of government or local municipality
Public servants can log in using identity card there they can access data in three basic formats:

- ESRI Mapping Software Shape File SHP
- MapInfo Table TAB, MAP, ID, DAT
- MicroStation DGN
These are X-Road services for public servants and entrepreneurs (XML)

List of the services:

- Cadastral unit query – data flow and browser interface
- Cadastral unit changes query – only data flow
- Administrative unit query - only data flow
- Administrative unit changes query - only data flow
- Cadastral unit restrictions query - data flow and browser
Cadastr as land reform register

65% of land registered in the cadastre before GIS

98,5% of land registered in the cadastre (October 2017)
New principles

Boundary point based cadastral system

- Moving from unit based to point-based data management.
- Boundary point changes will affect all touched cadastral units.
- Point-based system allows cadastral unit partial survey.
- A notation about quality issues is entered in the cadastre and it will be public.
New principles

Cadastral register has right to form cadastral unit

- Consolidation issues will start at cadaster.
- Cadastral register will decide what consolidation steps must done to achieve owners goal.
- Cadastral unit can be formed virtually without on field survey.
- Cadastral register will calculate the area of immovable.

Planned amendments in the Land Cadastre Act
New principles

Topographic database integration to cadaster

✓ **Land cover is determined on base of topographic data.**

✓ **Cadastral boundary data will be linked to topographic data and to track the changes.**
Thank you!

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