Lunching with Smart Cadastrobots

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FIG Young Surveyors Network – European Meeting
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Het dagboek van Schermerhorn
Geo-Information Science + Earth Observation

change agents + leaders

+65 years

+150 countries

+20,000 alumni

2010 merger
Land Administration
Our goal

build capacity to acquire knowledge and apply spatial and social skills on the relationship between people, rights, and land
Technological + Institutional

STDM

LADM

Pro-Poor

Fit-for-Purpose

Automation...
There simply isn’t enough conventional surveyors...
In many countries, only a small percentage of land is covered by the cadastre...
...in many countries the age profile of the land profession looks like this...
...and they cost quite a bit to train

6 years of primary school education
6 years of high school education
4 years of tertiary education
2 years of on-job or certification training

300,000 EU worth of training costs (approx)

We haven’t even paid for a day of surveying yet

We haven’t even paid for equipment yet
‘Kadaster Netherlands reduced its workforce from 2600 to 1500 in 8 years’

Kees de Zeeuw (2015)
Kadaster International
So, what is going on?
Citizens, surveyors, and technology have always combined to create the cadastre...
However, in recent times, surveyors have dominated....
…but, the **tide is turning** back…

**Citizens**
mandated mobs

**Machines**
cadastrobots

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the mandated mobs
Crowdsourcing Support of Land Administration
A new, collaborative partnership between citizens and land professionals

RICS RESEARCH

rics.org/research

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1. Sketch mapping involves community members drawing pictures of their lands and natural resources on a large piece of paper. The exercise can help to create a general understanding of the community’s spatial layout and promote discussion of land and natural resources management. However, sketch maps are difficult to use to identify specific locations or distances.

2. Satellite imagery mapping involves using printed, high-resolution photographs of the community’s lands taken from satellites. This imagery shows community lands and natural resources in detail and can be used to create maps that are more accurate and useful for calculating distance and area. In this strategy, community members draw maps on top of printed satellite imagery.

3. Digital mapping involves using mapping software to create digital maps of a community’s spatial information. In some approaches, the software can be used to project satellite imagery from a computer onto a large screen, where community members can interact with it and identify
STDM AS A CONCEPT
There is a gap in the conventional land administration systems such that customary and informal tenure cannot be easily handled. There is a need for complimentary approaches in land administration.
Citizens are taking back a bigger piece of the pie

- Developers
- Cadastral Surveyors
- Notaries
- Conveyancers
- Land Registry Officials
- Title Insurers
- Estate Agents
- Mortgage Providers
- Barefoot Surveyors
- Grassroots Surveyors
- Para Surveyors
- Trusted Intermediaries

- Citizens
- Technology
- Surveyors
What tools do citizens really need?

How much can *or will* citizens do?

Is there a line?

Where is it?
the
cadastrobots
2000
Intelligence
→
Robotic
Total
Station

2015

2025

Olson et al (2013)
Automatic
Boundary
Extraction

Automatic
Map
Generalization

Robotic
Mapping
Fleets

UAVs

…Cadastobots?

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**Courtesy:** X, Luo, (2016), Investigating semi-automated cadastral boundary extraction from airborne laser scanned data, MSc Thesis, ITC, University of Twente, The Netherlands.
Robots are increasingly being used for repetitive cadastral tasks...
The cadastrobots are coming!

What are the implications for land professionals?

How much can *and should* be automated?
We've kicked off
its4land officially gets underway

We're creating seven new tools to make land rights mapping faster, cheaper, easier, and more responsible

- Get Needs
  A tool for sharing, understanding and visualising what users really need

- Draw and Make
  A tool that converts hand drawn sketches into computer-ready boundary maps

- Fly and Create
  A boutique imagery creation tool tailored for land rights mapping - anywhere, anytime

- Automate it
  A tool that discovers visible boundaries hidden in imagery, and converts them to usable land rights information

- Publish and Share
  A tool for simplifying land rights information processing, storage, and visualization

- Govern and Grow
  A governance and capacity development tool aimed at making land rights mapping sustainable

- Capitalize
  A tool that ensures land rights mapping solutions are financially sustainable - and more than just 'pie in the sky'
Take a moment to think about this…

Perhaps the future about training surveyors to train cadastrobots to adjudicate, demarcate, survey, and disseminate?

…even at ITC
...lunch would certainly be cheaper
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Thanks. Questions. Discussion.
...but, maybe it’s not so simple?