The Land Code –
Aspects for future of cadastral data

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### Revolution

<table>
<thead>
<tr>
<th>Revolution</th>
<th>Year</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1784</td>
<td>Steam, water, mechanical production equipment</td>
</tr>
<tr>
<td>2</td>
<td>1870</td>
<td>Division of labour, electricity, mass production</td>
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<tr>
<td>3</td>
<td>1969</td>
<td>Electronics, IT, automated production</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Cyber-physical systems</td>
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</tbody>
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Social and economic context today and tomorrow

Increased participation, closer cooperation between producers and consumers, decentralization:

- sharing economy with sharing platforms: AirBnB, Uber, Wikipedia, car sharing, bike sharing, handicraft web, TripAdvisor, Facebook, Twitter, eBay, booking platforms, OpenStreetMap, etc.

- music industry and bookselling trade did undergo revolutions

- finance sector: Bitcoin, digital transactions, mobile payments (Apple Pay, Android Pay, etc.)

- supply is not happening any longer from a few central supply points, but will be much more decentral with shorter distances and closer contact between suppliers and consumers
The four revolutions in land information

1st
Triangulation, Orthogonal methods, Plans

2nd
EDM, Photogrammetry, Maps

3rd
fully digital format, GIS, thematic layers

4th
"Smart", Land Code
4th Revolution in Land Administration

What is Land Administration all about?

- it is about **documenting objects**: land objects
- it is about **connecting** these objects to other data and information, eg. land parcels to rights and people
- it is about **transactions** that these objects and connections are undergoing

Link to developments in the "smart" world:

- **Documenting** → Big Data, Data Mining, Deep Learning
- **Connecting** → Linked Data, Internet of Things, Meta platforms
- **Transactions** → Blockchain technology
Documenting – Land Objects

- Sensors everywhere
- Big Data, Data Mining
- Machine Learning, Deep Learning
- Neural Networks
- etc.
Connecting – Linking Data, Information, and Services

- Linked Data
- Internet of Things

- **Meta platforms** (eg. Google, Apple, Facebook, Amazon, etc.)
Meta Platforms

Providing products and services on one contextual environment with the same or similar user interfaces.

Existing examples:

• App stores: App Store (iOS), Google Play (Android), Windows Store, etc.
• Map services: Google Maps, Apple Maps, Bing Maps, Here, MapBox, etc.

The basic idea is to provide a common platform (with the same look-and-feel), where market participants can "plug-in" their services.

A whole new way of setting up value chains.
Meta Platform – The Google Way

Search
Gmail
Drive
Translate
YouTube
Play Store
Maps
Shopping
Calendar
Wallet
Docs
Flights
News
Patents
Transactions – Blockchains

Description of Blockchain on Wikipedia.org:

- A blockchain is a distributed database that maintains a continuously growing list of records, called blocks, secured from tampering and revision. Each block contains a timestamp and a link to a previous block. By design, blockchains are inherently resistant to modification of the data – once recorded, the data in a block cannot be altered retroactively. Through the use of a peer-to-peer network and a distributed timestamping server, a blockchain database is managed autonomously. Blockchains are "an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way".
Areas where Blockchains are or might be applied

- digital currencies: Bitcoin, Ethereum, etc.
- booking platforms: AirBnB, Uber, booking.com, etc.
- airplane industry: management of plane parts
- car industry: transactions and management of spare parts
- to protect genuine products from counterfeit products
- flower auctions: to manage transactions and to proof origin
- medicine: protection against false medicine
- container shipments: logistics, customs, deliveries

➤ to keep the certificates and transactions secure, to decrease mistakes, and to eliminate corruption in business processes

Features:
- no central system or institution is required
- trust is placed on a distributed/decentralized system
- transactions can be monitored by all
Examples of Blockchain applications in land administration

Sweden
• potential risk of a central register → central point of failure
• in the digital age, trust may be shifting from central DBs to decentralized systems

Georgia
• long and complex process involving many agencies, undetermined parcel boundaries, disputes, court decisions, delays due to flawed title documents
• blockchain is tamper-proof with verifiable transactions
• sharp increase in registration numbers, growing interest of citizens

Ghana
• Bitland project with Cadastrals

Ukraine
Conclusions

- it will not be us documenting the land in the future, the land will "document" itself through sensors, smart devices, etc., all creating computational code;

- legitimate needs and the law might be derived from such codes and be implemented in administrative services of the future;

- Code + Algorithms → The Land Code

- the future role of governments is to provide platforms that are open to the establishment of (computational) land codes;
- and the different stakeholders and parties of land management then can "plug in" to such meta platforms.
EU Ministerial Declaration on eGovernment, signed in Tallinn on 6 Oct. 2017

- signed by 28 EU countries (incl. GB) + IS, FL, NO, CH
- ... the overall vision remains to **strive to be open, efficient and inclusive**, providing borderless, interoperable, personalized, user-friendly, end-to-end digital public services to all citizens and businesses – at all levels of public administration.

- Policy action lines:
  1) Digital-by-default, inclusiveness and accessibility
  2) Once only
  3) Trustworthiness and Security
  4) Openness and transparency
  5) Interoperability by default
  6) Horizontal enabling policy steps
Parliamentary Motion

Internet of Things – Designing the framework for a national and international ecosystem

- The Federal Government is called upon drawing up good conditions for the creation of a national and international communication ecosystem underpinning the Internet of Things (IOT).

- For objects/things to communicate with each other, communication networks are required to satisfy several criteria: economical, good coverage; inter-connected at least throughout Europe; ability to roam; resilient to interruptions.

- The global management of IP addresses and other existing addressing systems must be addressed.