The Land Code

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**WEF 2016: The Fourth Industrial Revolution**

**Navigating the next industrial 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>
</tr>
<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>
</tr>
</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

2nd
EDM, Photogrammetry

3rd
GIS, fully digital format

4th
"Smart"
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. to rights and people
- it is about **transactions** that these objects and connections are undergoing

Developments in the "smart" world:

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

- Sensors everywhere
- Big Data, Data Mining
- Machine Learning, Deep Learning
- Neural Networks
- etc.
Connections – 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
- Play Store
- Patents
- Flights
- Drive
- Maps
- News
- Shopping
- Docs
- Translate
- Calendar
- Wallet
- YouTube
- Photos
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 currency: Bitcoin / Ethereum
- sharing platforms: Amazon, 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:
- trust is placed on a distributed/decentralized system
- transactions can be monitored by all
- no central system or institution is required
Examples of blockchain 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
Conclusions

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

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

• Code + Algorithms $\rightarrow$ The Land Code

- future role of governments would be to provide platforms that are open to the establishment of (computational) land codes;

- the different stakeholders and parties of land management can then "plug in" into such meta platforms.