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"Geospatial Information for a Smarter Life and Environmental Resilience"

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Blockchain, a Feasible Technology for Land Administration?

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Outline

1. Introduction
2. Blockchain technology
3. Case study
4. Summary of findings and conclusion

Land Administration traditionally deals with modern technology

Land Administration has to analyze trends and technologies in order to decide whether they can be sufficiently adapted or not.

Blockchain is only one of the emerging technology used in eGovernment.

This presentation is about the analysis of potential benefits of Blockchain technology in Land Administration process (ownership transfer).

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Blockchain Technology in a nutshell

What is this about?

(a) all transaction details are collected by a software (date, time, kind of transaction, invoice…)

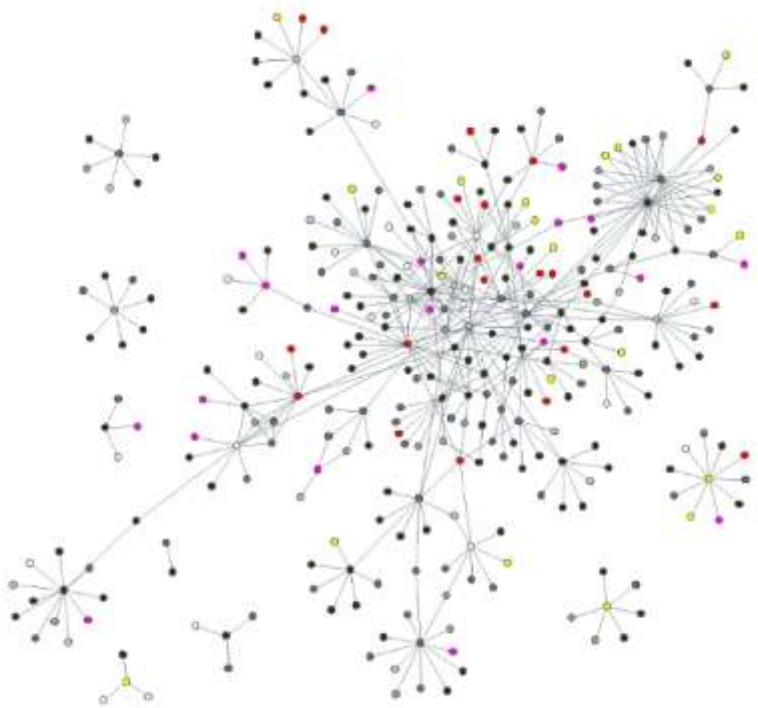
(b) decentralized public platform, no central server

(c) EVERYBODY has access to ALL transactions

(d) verification by several independant users

(e) trustful and highly secure

(f) encoded communication



How does Blockchain work?

(a) tamper resistent public database where all transactions are stored and verified by network independant contributors computing power

(b) each block of transactions is linked to previous using hash tags (digital encrypted fingerprints)

(c) every client stores the history of all transactions back to the first block

(d) open and world-wide usable ledger technology for any type of value (money= Bitcoin, property…)

(e) works with standard internet protocols

Potential Use Cases

Blockchain technologie offers new opportunities for:

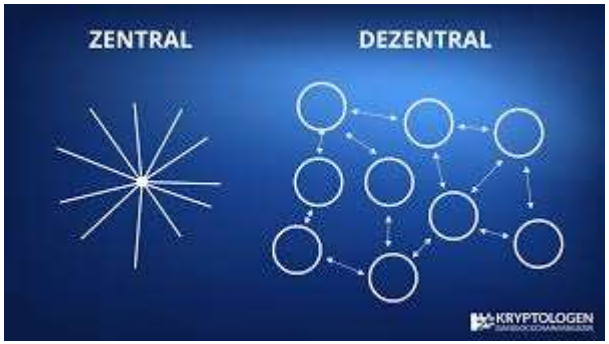
(a) registration of ownership certificates

(b) any transactions where time stamp is needed

(c) transparent governance for several envolved parties

(d) tamper-proof system

(e) post disaster data recovery



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Application of Blockchain in land registries - Case Study

If you are not sure a new technology is feasible, learn from others!

Countries with pilot projects on blockchain-based cadastre and land registry solutions:

- Brazil
- Dubai
- Georgia
- Honduras
- India
- Japan
- Russia
- Sweden
- UK
- USA
- …

Property registration in Germany

State law - 16 states -

e.g. Ministry of Finance in Bavaria

Cadastral offices

Federal law

Ministry of Justice

Land registry offices in the local law courts

Real Estate Cadastre

Land Registry

Numerical survey data

Real Estate Map

Real Estate Register

Contents: owners, properties, restrictions, mortgages

Identificator of a parcel is a parcel number

ALKIS: integrated system including cadastral map and register
(up and running)

Digital Land register
(under development)

Shortcomings of the current ownership transfer process

- The process of transferring ownership of land is a process of many, small steps. A lot of individual conditions must be fulfilled in the process, so that the next step can be initiated.
- In Germany, the process of land purchase, starting with the agreement between buyer and seller and ending with the entry in the land register, **usually takes between 5 - 6 months.** This often leads to delays in the economic transition (ownership, use) of a plot and hinders investments.
- The many small, very bureaucratic processes between the actors lead to issuing and transmission of many additional documents that are often sent by ground mail.
- The documents and the identity of the signing person must be checked by hand. This is a time consuming and error-prone process.
- Late involvement of the land registry in the land purchase process. Therefore, submitted documents and decisions are evaluated rather late in the process.

How can Blockchain help?

- The legally defined ownership transfer process cannot be changed easily or in a short term. Therefore the analysis of Blockchain technology **is based on the current analogue process**, supported by modern technology. In future this might be changed.
- Main objective is to speed up the ownership transfer process by getting rid of some bureaucratic process steps.
- Most of the potential improvements can be seen at the **land registry processes** rather than **cadastral processes.**

Process of ownership transfer using Blockchain

The digital process of transferring ownership can be conducted considering the following assumptions:

- Affiliated actors are buyers, sellers, notaries and land registries. Tasks of notaries attesting to signatures can be assumed by Blockchain, but not the tasks of checking documents for registrability and contract execution.
- Actors receive only digital files with necessary agreements to transfer ownership and to transaction history
- Authenticity of the procedure, signatures and property confirmation file are stored in the Blockchain
- Land Registry stores a Blockchain with proof of sales
- All actions are signed and passed to the Blockchain
- All participants see the same information and evidence of all performed actions by the other actors

Results of the study – possible advantages

- Reduction of the duration of the entire process from 5 - 6 months **to 1 - 2 weeks possible**
- Most of the data for conducting the process is already included in the Blockchain-based land registry – no additional data sources required
- Digital signatures provide a higher level of security than manual document filling (risk of errors and fraud decreases)
- All actors can digitally store relevant documents; data and documents cannot be lost due to decentralized data management
- Increased transparency, no "black box feeling"
- Completely digital experience, no media break
- Lower costs for buyers and sellers with higher efficiency

And the Cadastre?

In principle, the introduction of a new technology should only take place if identified deficits could not be eliminated without using this technology.

Deficits, for example, would be a lack of transparent administrative action that could lead to a breach of trust between the involved parties. However, such a risk is currently not apparent.

Another deficit might be the process of ownership transactions is considered too long, which is, however, not the core task of the cadastral administration.

So, cadastral administration plays an important but subordinate role in the ownership transfer process, as it provides the technical basis for a contract, but is not involved in the actual transfer of ownership (at least in Germany).

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Summary of findings

- The Blockchain technology has a strong potential to support the digitalization of land administrative processes.
- Disruptive developments are currently not to be recognized or feared.
- The centralized approach for the land registries in Germany has proved successful, that there is no need for a decentralization which would be introduced by using Blockchain.
- The use of that technology will certainly optimize the government's administrative actions, but will not replace them completely.
- In the German cadaster, neither a loss of trust nor a breach of trust (between institutions) can be detected, which would require the use of a tamper-proof system like Blockchain.
- Shortening the administrative operations (e.g., when changing ownership) appears to be required, but is not the core task of the cadastral administration.

Conclusion

- As shown there are many benefits using Blockchain technology in the land register, even if a sophisticated electronical register is already in place.
- If combined with other state-of-the-art technology the process of ownership transactions can be significantly optimized.
- Blockchain could effectively support the process of digitalization of governmental services.

- The answer to the question "**Blockchain, a Feasible Technology for Land Administration?"** is "Yes!". However, a lot of challenges (technical, organizational) have to be tackled.