Electronic signatures and blockchain usage.

Has it made a difference?

The Case of Estonian Land Register

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Nr._

...
Title of ownership to real estate

I part - location, address

II part - Ownership

ID, name

Co-owners

III part - Encumbrances and restrictions

Road servitude

IV part - Mortgages

Mortgage 100 000 EUR to Bank

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Government guarantee to electronic information by law
Once only principle!

Secure data exchange platform: X-Road

Blockchain like technology

https://ervinal.eesti.ee/
How to make paper register efficient?

Electronic signature offset
1. Efficiency and security
   - Increased productivity
   - Reduced costs
   - Improved security

2. Organizational reforms

3. Savings
   - Reduced paper usage
   - Lower storage costs
   - Reduced overhead costs
Data mining project 2000 - 2008

- Data mining from paper Title page- letter by letter.
- Electronic register gained legal power in 2008

Deed scanning project 2008 - 2015

- More than 900,000 files.
- All in all over 8,000 shelf meters.
- Meta data mined in the scanning process.
- Scanning performance ca 15 minutes per file, 3 files per hour.
- 24 scanners, 24 extra staff hired.
- 12 cameras for large maps.
- Paper file documents are digitized as separate PDF files.
- Electronic signature added to guarantee electronic document integrity.

Challenges:
1. Document format A3 and larger - Plans.
3. Files containing more than 1000 pages.
4. Meta data quality

- Budget: approx. 1 130 155 EUR
- Scanned: 525 500 files (2,1 EUR per file)
- Result: 100% files in electronic format.
AS-WAS:

8000 meters

Results:

AS-IS:

0 meters
Service desk is empty, users are online
22 registrars in Land Registry of Estonia
Processing time today 6 days

Paper process
Buyer Seller Notary Electronic signature

Electronic process
Registrar Land Register Electronic Signature

XML structured data
E-mail notification
Buyer Seller
Change is progress:

- Faster process for conveyancing parties;
- Better information quality;
- Better security/integrity;
- Better availability, online archive;

Efficiency for stakeholders:
- courts, bailiffs, notaries, Gov;

Efficiency for private companies:
- agents, banks;

Efficiency for registrars;
  - no need for counter service
  - less archive; less paper;
  - equal work load
  - less technical staff
  - less costs
  - home office

Results:

AS-WAS

8000 meters

AS-IS

0 meters
- home office
Challenges!? 

Long term archiving

• Signature cryptographic keys (1024) get old and vulnerable.
  
  Solution:
  • Use stronger cryptographic keys (2048).
  • Resign old documents with stronger key (6.5 million electronic documents).

Unexpected outside threats

• Cyber warfare,
• DOS attacks (harmless)
• Flaws in technology
  • 700 000 citizens ID-cards have technical flaw!!!

Solution:
• Time to repair - 15 days.
• Use mobile-ID
• Update certificates from distance
Cracking of one ID card would require Estonia to deactivate 750,000 cards (3)

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Estonian ID card. Source: (Postimees/Scanpix)

Should even one of Estonia’s national ID cards be cracked, the certification center of the Police and Border Guard Board (PPA) would be obliged under law to void all of the approximately 750,000 cards containing the chip in which a security flaw was discovered at the end of August.
Is blockchain a solution? What is the problem?

Security - integrity of data

Title records:
1. Owner is John
2. Owner is Mary
3. Owner is Alastair

Land Register

Hash 1
John

Hash 2
Mary

Hash 3
Alastair

Security - availability of data

Block 1
1234
2345
3456

Blockchain-distributed ledger database

Guardtime

Block 1
Block 2
History of Land Register information systems

- 1991: Paper LR
- 1994: LR IS ver1
- 1997: LR IS ver2
- 2000: LR IS ver3
- 2003: 3 years
- 2006: 6 years
- 2016: E-notary
- 2020: eJustice portal

- 14 years
- Electronic register KRIS4
- Online information

Paper register → Electronic register
LIS Project
Development of the new generation land register information system

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Join us!
www.landregister.eu
Electronic signatures & Blockchain
Has it made a difference?

#reuse
#share
#interoperable
#blockchain

Maximum availability and security

E-services + e-signatures + blockchain = security & efficiency