Smart contracts for PropTech
Smart enough?

Sept. 4, 2019 – Smart Buildings 4 Smart Cities
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What smart contracts are
A quick look at the evolution of ICT (functional view)

Information

Ubiquity
Digitize everything

Transactions

E-commerce
M-commerce

Internet of Things

Sensors & controls
Massive data flows

A tipping point for the Real Estate sector?
What are blockchain and smart contracts?

Blockchain is an Asset Transfer Protocol
- Distributed Ledger
- Cryptography
- Immutability & peer-to-peer validation (miners)
- Permissionless / Permissioned

Smart Contracts are a Transaction Protocol for Existing Rules
- Store
- Verify
- Self-execute
How blockchain and smart contracts disrupt classical legal processes

Distributed trust
• Hack the central authority/middleman
• Create trust by technology

Immutability
• Traceability
• Authentication

Self-execution
• Trigger events ("if this… then that…")
• Automated performance
2 Use cases for smart cities/buildings
• Land ownership and information registry ("oversimplify due diligence")
• Property & facility management (operate rentals, sustainable energy management, etc.)
• Home services (e.g. renovation management)
• Listings and search tools
• Insurance: slicing coverage per parcels or rental periods, etc.
• IoT for home security, energy consumption, etc.
• Tokenization, ICO's, etc.
• Slock
• SafeShare
• Bitfury/Estonian government
• Propy
• (…)

But real use cases still need to get their bearings
slock.it connects devices to the blockchain, enabling the economy of things
Propy.com

Visit a property
Find your dream home, then close online on Propy.

Sign
E-sign the offer, disclosures and other documents via DocuSign.

Pay
Provide your bank account to initiate the transfer to escrow, or use crypto.

Get the deed
Deed is recorded traditionally and on the blockchain.

Try it out
A few legal challenges
The web of operators

- Developers
- Validation nodes
- Qualified users: markets, intermediaries, …
- End-users
- Third parties (including incumbent institutions & intermediaries)
The web of contracts

- Technology developer
  - Contract?
  - Development

- Solution provider
  - Contract?
  - Development
  - SOLUTION/ARCHITECTURE 'POWERED BY BLOCKCHAIN'
  - Flow

- Service provider/solution manager
  - Contract(s)?
  - Flow

- Specialised partners
  - Contract(s)?

- Users
  - Contract(s)?

- Participants
  - Contract?
"Data laws"…
Challenges of Privacy & Data Protection

- **Privacy by design**
  - Measures such as pseudonymisation to protect the rights of individuals
  - Implement and integrate DP principles into the processing
  - Ensure that by default (i) only personal data which are necessary… are processed, and (ii) personal data are not made accessible to an indefinite number of persons without intervention from the individual

- **User rights**
  - Data portability
  - Right to be forgotten?

- **Risk assessment & Security**
  - Assess risks & implement practical measures & policies
  - Data breach notifications (72 hours)
Challenges of Privacy & Data Protection

- **Blockchains are** (distributed) (transparent) databases
  - Definition of personal data
  - Although anonymous, can nodes/members still be traced back and re-identified?

- **Blockchains are distributed** (transparent) (databases)
  - Purpose limitation
  - Access limitation

- **Blockchains are** (distributed) transparent (databases)
  - Data minimization / storage duration
  - What elements of the self or of a person's identity are left on the blockchain? (property transactions, management of IoT networks such as smart meters, insurance contracts, etc.)
Smart Contracts & Risk Allocation

Smart contracts assume an underlying contract needs performance

- They may be a good fit for some contracts or transactions but not all of them ("vending machine")
- Underlying contract must be valid and accepted

Smart contracts operate automatically

- Provided that the contract rules have been well understood and adequately translated into code!
- "No need to go to court": seriously?
- Outside of existing legal remedies or limitations (e.g. consumer protection)

Smart contracts cannot foresee the unforeseen…

- Code and algorithms cannot capture all possible circumstances, errors, business changes, etc.
- Liability exposure remains governed by legal and contractual provisions → quid if the smart contract causes a bigger harm/loss than the "human" performance?
Legal check-list for Smart Contracts projects?

Identify
- The operators
- The constraints (regulatory, competition, data protection, consumer protection, etc.)

Protect
- Brands & trade secrets
- Build / IT developments
- Exploitation of results

Manage expectations & risks
- Scope of work
- Roles & responsibilities
- Timeline
- Exit arrangements
- Liability & Indemnities

Comply
- Definition of roles
- Security & Cybersecurity
- Data Protection & Information of Users
- Limitation of service benefits & risk exposure
Contract Rules for Access to Data

**Scope**
- Description of datasets, updates, processes, ...
- Quality and reliability of data
- Error notification

**Access & Re-use**
- Who has the right? Subject to what conditions & limitations
- Inferred data and results? Sub-licenses? Purpose limitation?

**Service performance**
- SLA's, infrastructure, transmission processes, ...
- Liabilities, sanctions, remedies, audits, etc.

**Post-termination**
- Hand-over data? Erase? Purpose limitation?

© like creativity… 😊
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A changing role for institutions and intermediaries?
Can Technology Restore Trust?

- **Intermediaries are accountable. Technology is not (and cannot be)**
  - E.g. if a patent assignment is not properly registered, in a totally decentralized setting, who will be responsible?

- **Transparency requires trust, as much as trust requires transparency**
  - E.g. in e-voting systems, anonymity is a must-have
  - E.g. transaction ledgers must be trusted by all users as a pre-requisite

- **Smart Contracts & Proof of transactions**
  - Smart contracts cannot be broken (unlike contracts) ; they are exposed to flaws in coding (don't blame the lawyers, then...)
  - Legal evidence still requires an intermediary / trusted third party
Role of central authorities for real estate transactions

Authenticate individuals
Certified register of land titles
Digital signatures
Digital awareness amongst users
Professional services disrupted?
A new role for notaries, agents, lawyers, etc.?

There's still a long way to go before full disruption…
But authorities can create a stimulating environment for blockchain
Thank you for your attention