Financial institutions
Energy
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AIDA Europe Conference Warsaw

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Partner
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Agenda

Smart Contracts	• What is it? • How does it work? • What is the relation between Blockchain und Smart Contracts?
Legal Aspects	• Legal Aspects
Live in Action	• Potential and Challenges • Current use cases

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Smart Contracts

> *I hear more and more people talking about 'smart contracts' these days. But when you push them to define the term, the concept often dissolves in their hands.*

Richard Gendal Brown,
A Simple Model for Smart Contracts,
Gendal.me, 10 February 2015

> *A smart contract is a set of promises, specified in digital form, including protocols within which the parties perform on these promises.*

Nick Szabo,
Smart Contracts: Building Blocks for Digital Markets, 1996

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What is it?

Drinks vending machine:

$$$$ is inserted into the drink machine and a drink selected

and ….

An irrevocable set of actions are set in motion:

- The money is retained
- A drink is supplied
- The transaction cannot be stopped mid-flow
- Money cannot be returned when drink is supplied
- The transaction's terms are, in a sense embedded in the hardware and software that runs the machine

In this abstract description, a smart contract is both an instance of computer code and a running software program that interprets the code, accepts input conditions and decides on outcomes

Source: Nick Szabo, Smart Contracts: Building Blocks for Digital Markets, 1996

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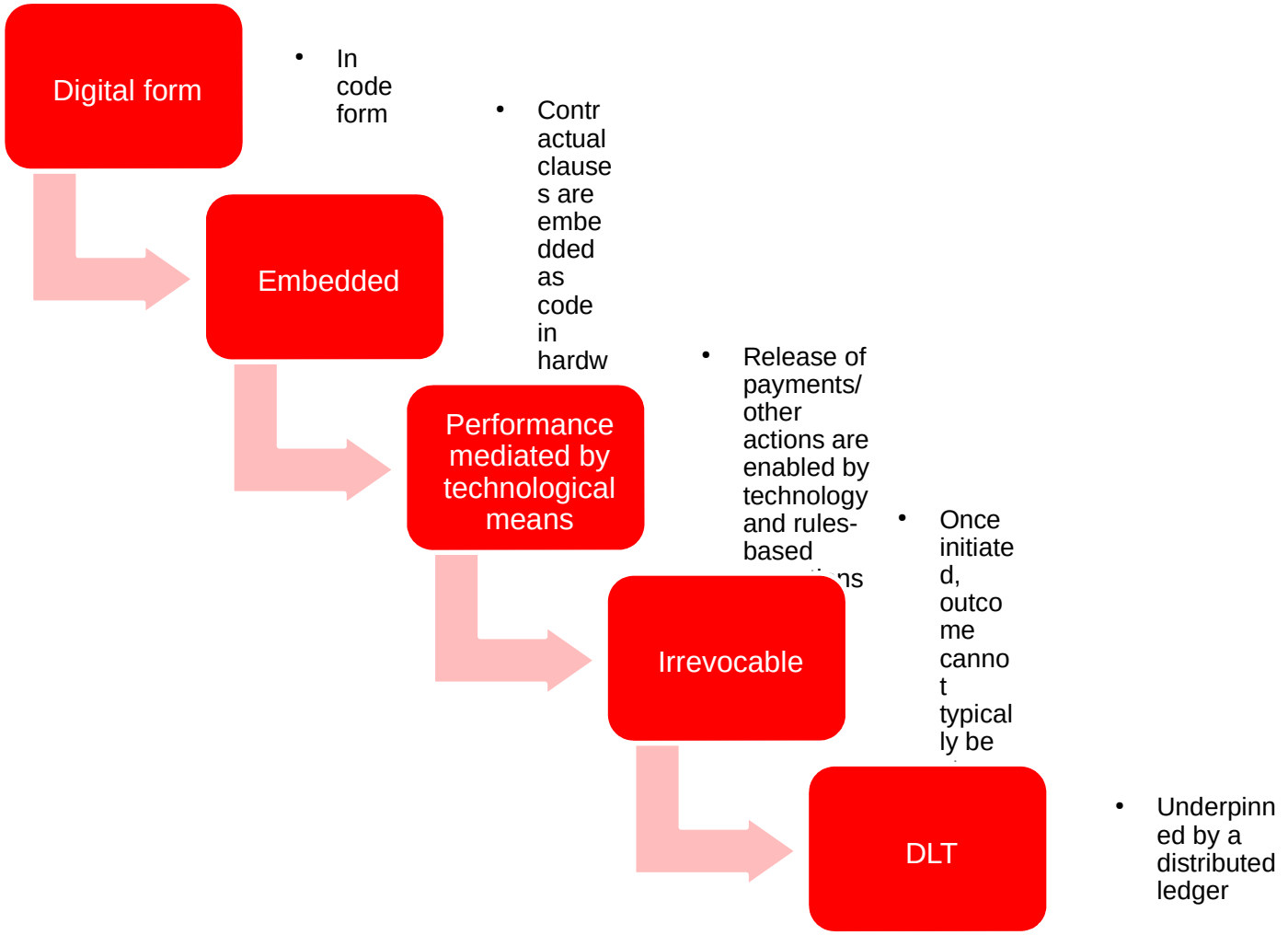
What is it?



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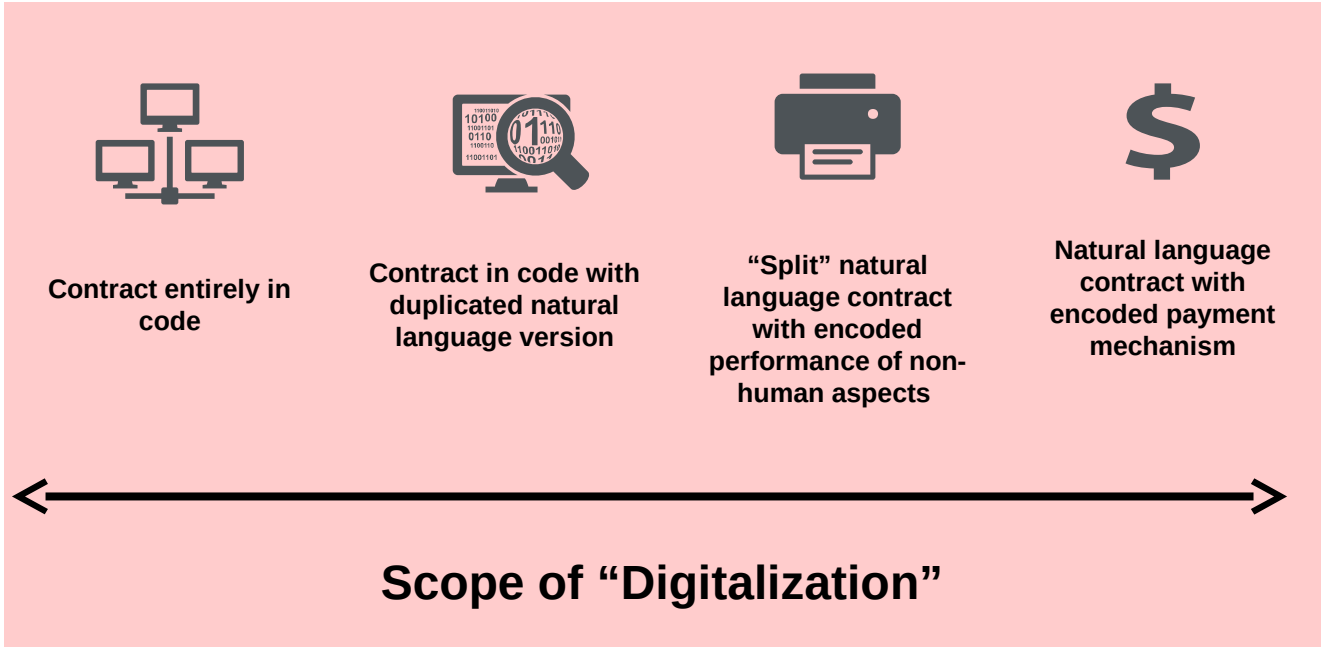
How does it work?



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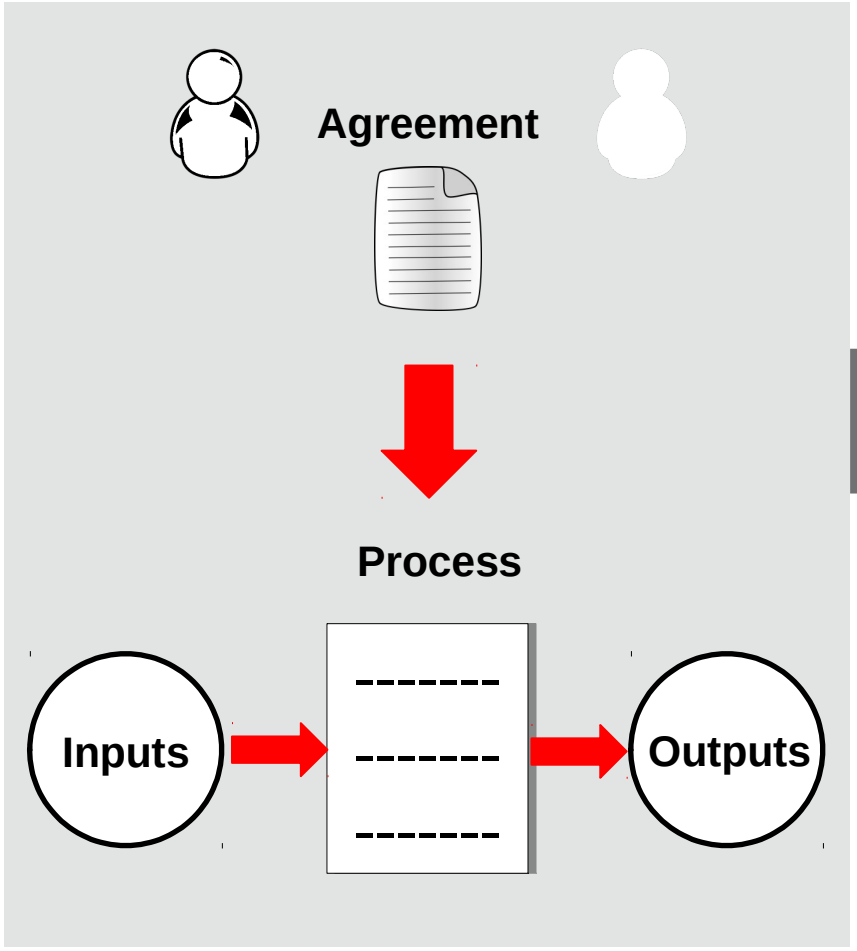
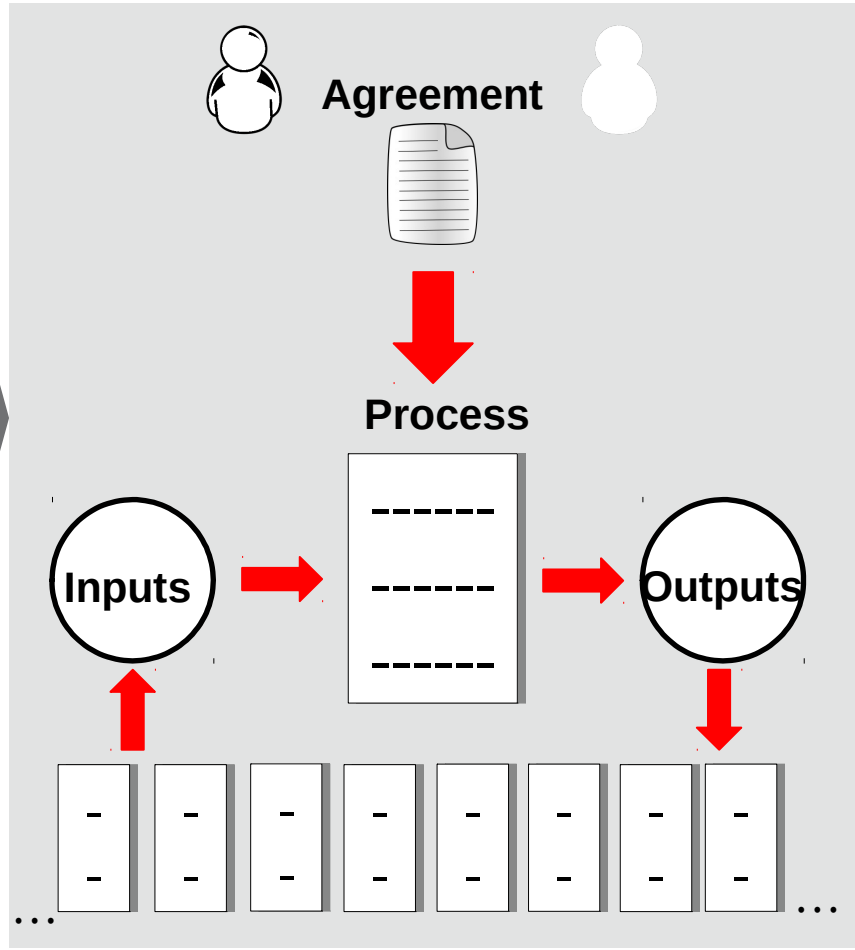
Relation between Blockchain/DLT and Smart Contracts

Smart Contract



Smart Contract based on DLT



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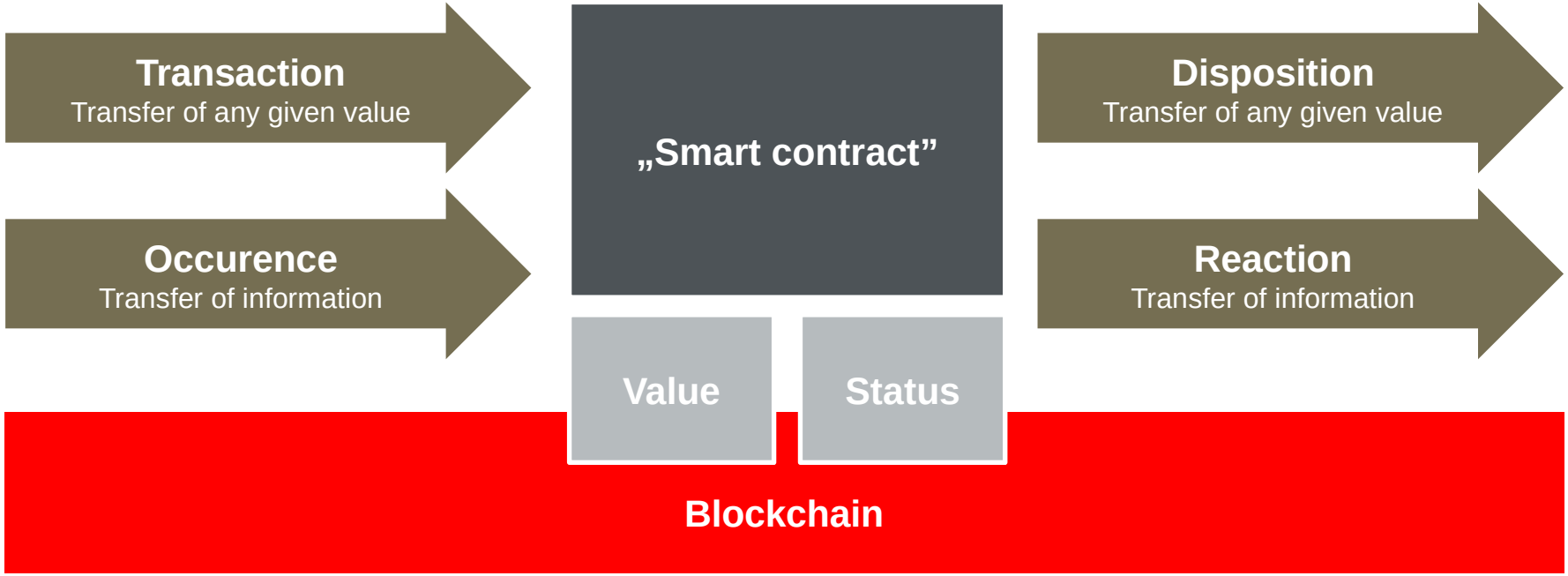
Relation between Blockchain/DLT and Smart Contracts



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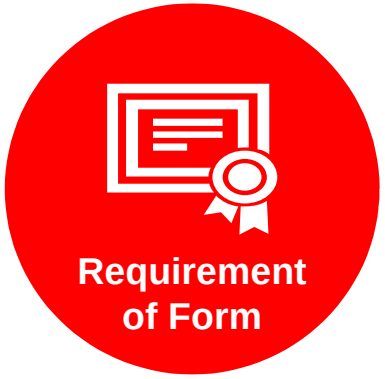
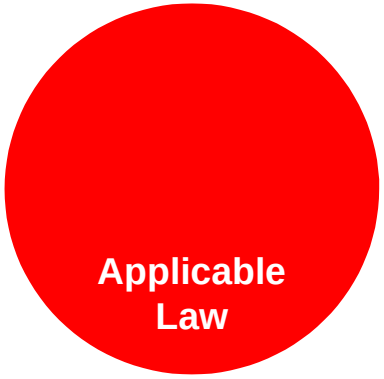
Legal Aspects





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Legal Aspects

Example Germany

- Smart Contracts are subject to the German Civil Code
  - Conclusion of contract by offer and acceptance
  - Minimum content: Performance, consideration, parties
  - Effective expression of will (BGH: Computers cannot express a will)
- Smart Contracts do not and cannot replace statutory law
- Pre-condition is always that the start of the smart process is attributable to a natural or legal person who is acting fully aware of expression of will

Simple use case

- Bidding – Agent in online bidding
- „Auto-reply“ – Emails

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Legal Aspects

Data Protection

- „Right to be Forgotten“ difficult to reconcile with the Blockchain
- Conflict with Art.17 – EU-GDPR possible, should personal data be included in the Blockchain
- Limitations to the transfer of customer data
- Conflicting concepts: GDPR requires data minimization and a purpose, Blockchain requires transparency and permanent storing of data
- Open: Is the data protection law applicable to public Blockchains as there is no responsible party pursuant to the GDPR?

Legal Aspects

Requirements of Form

- Statutory form requirement, like written form and notarization do not work
- Written form already an issue if code only
- Actions such as transfer *in rem* and registration require consummation outside of the code or a replacement

Amendments

- Smart Contract is in principle irrevocable and the execution is not under disposition of the parties (remember the Vending Machine)
- Amendments require intrusion with the code
- Problematic if there is no responsible party for the administration of the contracts

Legal Aspects

Applicable Law	• Choice of law may be difficult in particular if consumers are involved • Choice of law clause as a code may be challenging for courts • Enforcement may be difficult as global and anonymized interaction between the parties involved jeopardize that
Consumer protection	• Pre-contractual information • Obligations to provide advice • Cancellation rights (after cooling-off periods)

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Legal Aspects

Defaults in software

- Using a third-party platform may result in dispute on which of the parties involved is liable for a default in the contract or the system
- Consequences of unwanted and illogical actions of the system need to be taken into account
- 2017 Canadian digital currency exchange service (QuadrigaCX) lost access to one of its accounts for a period of time due to a default in a Smart Contract and lost a total of iHv. EUR 13 Mio.
  - QuadrigaCX on reedit:

> *"Due to an issue when we upgraded from Geth 1.5.3 to 1.5.9, this contract failed to execute the hot wallet transfer for a few days in May. As a result, a significant sum of ether has effectively been trapped in the splitter contract. The issue that caused this situation has since been resolved."*

Legal Aspects

Dispute Resolution

- Courts need to be provided with the possibility to interrupt or reverse the execution of the contracts (remember the Vending Machine)
- Concerns re proof of contract, as there is no classic deed that may be presented to the courts
- Implementation of Dispute Resolution Mechanism directly into the Smart Contract:
  - Centrally administered Smart Contract:
    - Administrator shall have the right to resolve disputes bindingly
    - Decentralized parties or in case the parties do not grant the right to the administrator:
    - Automatic delegation of the conflict to a dedicated arbitrator in case of conditions met (such as complaint by both parties)
    - Arbitration clause in real contract (as Backup) (Split-Model)
    - Arbitration forum, centrally managed or manage by the relevant ledger
  - Advantage: Decision of the administration body may be implemented into the contract directly, enforcement not necessary

Legal Aspects

Regulatory

- Customer protection against unfair treatment and discrimination of customer by automated execution („treat the customer fairly“)
- Supervision and powers of intervention of regulators need to be assured
- Responsibility of each of the regulators and the overlap, if any, need to be considered and decided
- Protection against unfair competition
- Right to complain and all judicial rights need to be safe guarded

Potential

- Cost reduction
- Verification of Identity
- Certification of transactions
- Non-deletable records
- Speed
- Automati-sation(IoT)
- Direct trade between strangers
- Low default rate, no manipulation

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Challenges

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Live in Action

- Underwriting:
  - Automated Underwriting for in particular small risk or short term risks (Pay as you fly by *Flock*)
  - Amendments to policies based on data submitted electronically

- Claims Management:
  - Claims Management Tools: Parameters met, claims paid or claims reduced (*rightindem* customer managed claims)
  - Automatized Settlement for accumulation losses (*micro harvest insurance* Kenia and Indonesia through smart phone for conclusion, premium)
  - Reinsurance

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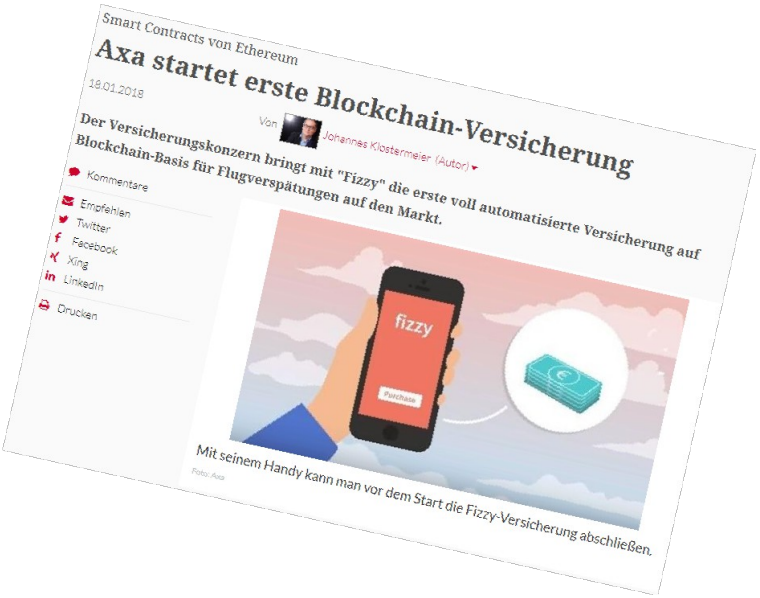
Live in Action

Insurance



- In September 2017 *Axa* brought *Fizzy* to market
- Sale and settlement through blockchain
- *Fizzy* is connected by Smart-Contract-network with a global air traffic data base, and air passengers will automatically be paid a claim in case of a delay of >2hours – no claim to be notified
- Premiums are equally calculated by a an upstream algorithm

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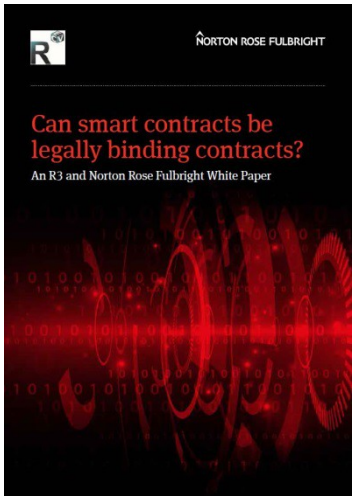
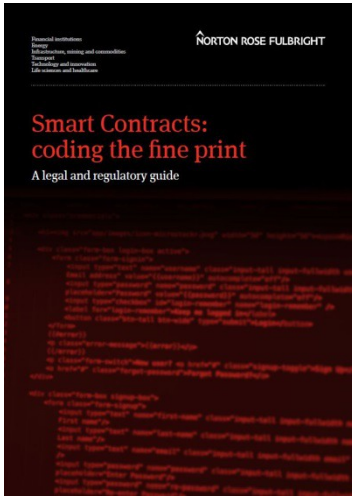
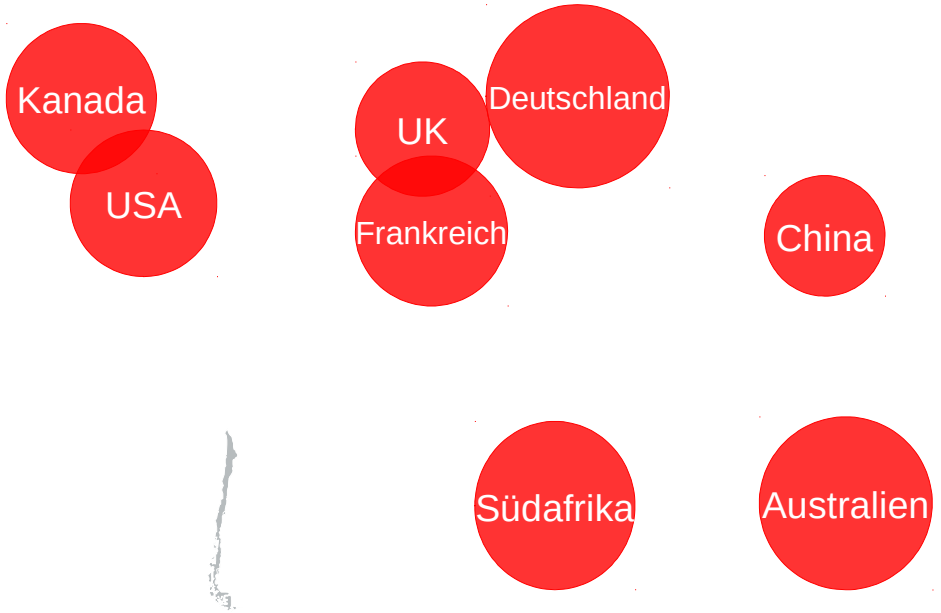
Our Publications so far







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