

XXVIII ELRA General Assembly
Rotterdam
22nd november 2019

Smart Contract Data and Land Registration

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Blockchain and smart contracts

- * Blockchain technology is a peer to peer system, without the intervention of intermediaries. “[t]he value add of blockchain is the whole anonymous world.”
- * But:
 - * There are some problems connected to blockchain related to (i) cost (ii) speed (iii) scalability (iv) security and (v) environmental impact;
 - * Blockchain technology can be slow, expensive and it might not scale enough for commercial or civic purposes;
 - * Although it cannot ascertain the identity or capacity of the parties to a transaction some consider that it might replace the notary;
 - * It's still an immature technology;

What are smart contracts?

- * Smart contracts:
 - * *“A contract stored as an electronic record which is verified by the use of a blockchain”* - Illinois Blockchain Technology Act
 - * *“A smart contract is a computer programme that directly controls some digital asset”* - Vitalik Buterin
 - * *“Smart contracts are a computerized protocol that executes the terms of a contract”* – Nick Szabo
 - * *“Decentralized agreements built in computer code and stored on a blockchain”* - Jeremy M. Sklaroff
- * The vending machine metaphor. Some consider blockchain-based smart contracts as a much narrower notion;

Are smart contracts able to challenge contract law?

Are these different from *traditional* contracts?

- * Smart contracts are automatic or self-executing contracts. They eliminate inefficiencies in traditional written agreements, reducing some transaction costs while preserving efficient forms of contractual flexibility;
- * *Traditional* contracts are agreements that create obligations enforceable by law expressed in an intelligible language.
- * Are smart contracts real contracts ? And are they really *smart*?:
 - * The original definition by Szabo explicitly provides that ‘no use of artificial intelligence is implied’. These are *smart* contracts because no human intervention is needed;
 - * They should accommodate normative language similar to *traditional* contracts namely considering contract formation, performance and remedial action;
 - * As so, they combine two different regimes (traditional and smart) which doesn’t allow straightforward answers for any problem;
 - * They can’t be used in an a certain level of uncertainty (because they are self-executing);

Smart contracts and land registry: much ado about nothing?

- * Entitlements *in rem* vs. entitlements *in personam* / “Property rules” vs. “liability rules”;
- * “*In rem* entitlements” may be acquired by means of an acquisitive system based on a title registry.
- * A self-executing contract is not sufficient for acquiring an *in rem* entitlement;
- * Smart contracts are self-executing contracts that produce effects *inter partes* (peer-to-peer):
 - * Should they be used in relationships with third parties or between third parties?;

Smart contracts and land registry

- * Blockchain is supposedly self-sufficiency but...
 - * ...in real estate contracts identity and capacity of parties should be revealed. For tax reasons, for example. As so, intervention of third parties (public authorities) is needed.
- * Civil law is based on principle of freedom of form but...
 - ...in order to produce *in rem* entitlements, blockchain would be the only and compulsory system within the jurisdiction that adopts it.
- * Contracts with a property transfer finality should be public for its efficacy *erga omnes* but...
 - ...smart contracts are automatic or self-executing contracts....
- * Solutions:
 - * To establish a *general* permission access to “real estate smart contracts”? Oracles? Blockchain and smart contracts with *erga omnes* effects?

Land registry and smart contracts

- * Land registry is needed for the provision of “*in rem* entitlements”;
- * Smart contracts are closed and self-executing contracts that produce *peer-to-peer* effects;
- * On the opposite, the production of “*in rem* entitlements” demands:
 - * Special databases (provided by the State? Blockchain?);
 - * To ascertain the identity and capacity of the parties in a transaction.
 - * Different types of real state rights (v.g. leasing); parties; conditions during the contract; etc.
 - * As so, the intervention of a third party is needed but ... blockchain and smart contracts are based on the principle of self-sufficiency.

Can smart contracts work as an *in rem* entitlement system?

- * Code of law is binary. Yes or no. Ambiguity is not allowed.
- * Code *as law*:
 - * Self-executing contracts - agreement made through a machine or program code, different from human languages. But:
 - * How to give a *human*, understandable and valid consent to smart contracts?
 - * How to assure the comprehension of the clauses and a conscious consent?
 - * How to interpretate *undetermined legal concepts* such as *good faith*, *diligent merchant*, *good pater familias*, *rebus sic stantibus*, *act of god* or *unforeseable facts* or *foreseeable though inevitable*?
 - * How to assure the interoperability of this system with others?
 - * How to assure the validity of the contract?
 - * How to produce retroactive effects in the event of cancellation of a legal transaction?
 - * Who is responsible in case of a mistake, namely before third persons? What if a third person opposes a contract or a transfer that violates their *in rem* entitlements (v.g. because they invoke adverse possession - *usucapio*)?
 - * Possible *oracles* of smart contracts (entity by which the smart contract system receives information about the external world) or a dispute settlement regime?

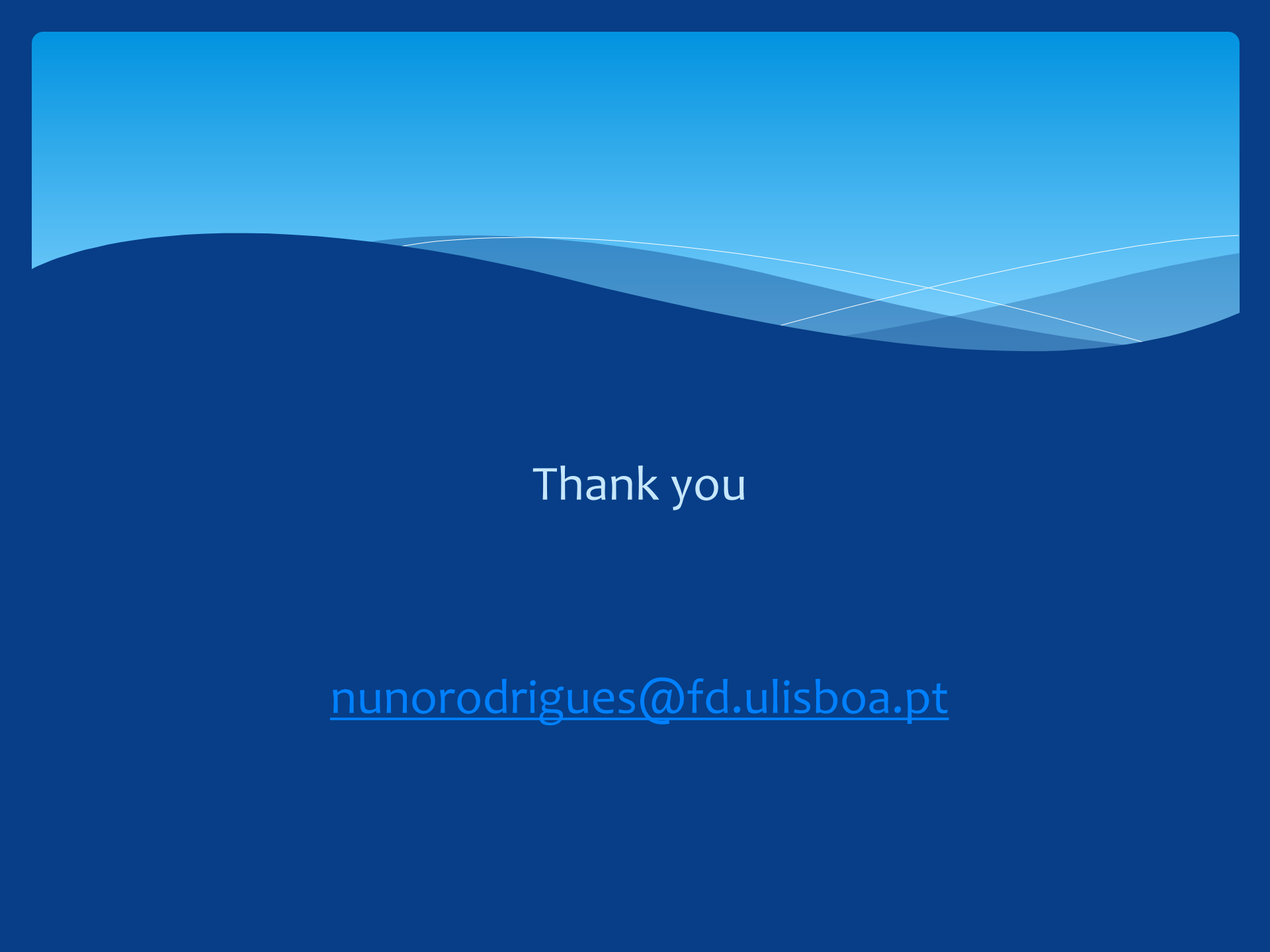
Blockchain and smart contracts are infalible?

The hard fork problem

- * Incidents do happen within the blockchain universe:
 - * A) Decentralized Autonomous Organization incident (2016);
 - * B) The Bitcoin Crash (2017);
- * After the incidents the management of the platform executed a hard fork.
- * These incidents revealed:
 - * A) The negation of the immutability or self-compliance of transactions and, therefore, the “code is law” principle;
 - * B) A central authority with no legal authority exercised an undeniable power;

Can smart contracts produce “*in rem* entitlements” in the future?

- * Different types of blockchain technologies (private and public) can lead to a fragmentation of this system based on different types of interest involved;
- * Some say that smart contracts may function only with digital goods and digital inputs.
- * Blockchain can help and be used to land registry (v.g. developing countries) but... smart contracts will not provide, in the near future, “*in rem* entitlements”.
- * If real estate contracts are not self-executable (like smart contracts are), then a third party is needed.
- * As so, (public) regulation will still be needed in the future but:
 - * Law procedural frameworks will have to be adjusted to new technological methods;
 - * New techno-legal skills will be needed for employability aspects;

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Thank you

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