Blockchain & Legal Innovation 1

Readings List

# Topic 4 - Smart Contracts

## Introductory

### Chapters 5 & 10: Blockchain and Law: The Rule of Code by De Filippi & Wright

## Underpinnings

### Nick Szabo: https://nakamotoinstitute.org/the-idea-of-smart-contracts/

### Nick Szabo: https://nakamotoinstitute.org/formalizing-securing-relationships/

## Contrarian

### Legal Difficulties: Schuster, Edmund-Philipp, Cloud Crypto Land (November 21, 2018). LSE Legal Studies Working Paper 17/2019. Available at SSRN: [https://ssrn.com/abstract=3476678](https://ssrn.com/abstract=3476678" \t "_blank) or [http://dx.doi.org/10.2139/ssrn.3476678](https://dx.doi.org/10.2139/ssrn.3476678" \t "_blank)

### Social & Computational: KAREN E. C. LEVY "Book-Smart, Not Street-Smart: Blockchain-Based Smart Contracts and The Social Workings of Law" CORNELL UNIVERSITY Engaging Science, Technology, and Society 3 (2017), 1-15

### Inflexibility: Sklaro, Jeremy M., "Smart Contracts and the Cost of Inflexibility" (2018). Prize Winning Papers. 9. https://scholarship.law.upenn.edu/prize\_papers/9

## Synthesis:

### Cohney, Shaanan and Hoffman, David A., "Transactional Scripts in Contract Stacks" (January 31, 2020). U of Penn, Inst for Law & Econ Research Paper No. 20-08. Available at SSRN: [https://ssrn.com/abstract=3523515](https://ssrn.com/abstract=3523515" \t "_blank) or [http://dx.doi.org/10.2139/ssrn.3523515](https://dx.doi.org/10.2139/ssrn.3523515" \t "_blank)

## Oracle Problem:

### Chainlink Whitepaper:

## Uses/Cases/Issues

### Finance: https://www.santander.com/en/press-room/press-releases/santander-launches-the-first-end-to-end-blockchain-bond%C2%A0

### DAOs and LAOs: https://medium.com/openlawofficial/the-lao-a-for-profit-limited-liability-autonomous-organization-9eae89c9669c

### DeFi:

#### MakrDAO Hack: https://coingape.com/makerda-hacker-liquidated-8m-ethereum/

#### dForce Hack: https://www.crypto-news-flash.com/another-defi-hack-25-million-in-bitcoin-and-ethereum-stolen-from-dforce/

#### Flashloan: https://www.trustnodes.com/2020/02/15/hacker-makes-360000-eth-from-a-flash-loan-single-transaction-involving-fulcrum-compound-dydx-and-uniswap

### Augur Problem: https://breakermag.com/core-developer-says-augurs-working-on-a-fix-for-invalid-market-scam/

### Contracts: OpenLaw: https://www.openlaw.io/ especially their Token Forge https://docs.openlaw.io/token-forge/#creating-a-token

### Non-Blockchain: Clause https://clause.io/

# Key Themes

## Smart Contract was a term first coined by Nick Szabo. He conceives of it essentially as a digital vending machine whereby a certain outcome is reliably delivered for a given input without the need for trusted third parties.

## The term "smart contract" has been misunderstood and even abused. There is confusion about what is the "contract". Is the code the contract? Or is there a broader contract of which the use of the code is a component part?

## Also, the programs are not necessarily that "smart". Like a vending machine, they cannot deal with complex deals.

## Further there is the oracle problem - blockchains deal best with on-chain data. Where they are informed by off-chain data - like price feeds - they need a secure and reliable source for the data, otherwise the contract can be manipulated.

## The inflexibility of coded contracts and the oracle problem makes them vulnerable to hacks and unintended consequences.

## Further, it is not certain that clients actually want the inflexibility that smart contracts entail. Most people treat contracts as a social obligation, not a "hard" one. Consider the implications if all debts \*had\* to be paid on time...

## There are hybrid examples, like OpenLaw that use code to enforce certain aspects of a contract whilst leaving the remainder of the contract to written text. Taking it a step further is companies like Clause that provide a wholly centralised, non-blockchain mechanism for automating contracts.

## Despite the criticisms development of smart contracts continues. This is largely because the law manufactures and protects rights, it does not produce real world outcomes. Clients are looking to smart contracts as a way of securing real world outcomes with reasonable certainty and trading off "perfection" of legal rights for certainty of outcomes. They are thirsty and while the digital vending machine does not deliver a strawberry smoothie, it does reliably provided a drink.

## One area where smart contracts will also play a role is the Internet of Things, autonomous devices using digital currencies to negotiate and pay for their own services with other autonomous devices.

## In the future, we may see "smart statutes". Focussing on binding legal outcomes helps conceptualise away the whole "is this a contract?" problem and instead focus on the problem of whether and to what extent legal rights and obligations can be translated into reliable real world through decentralized computer code.