

BLOCKCHAIN:

RIDING A ROLLERCOASTER TOWARDS A STANDARD

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AGENDA

- INTRODUCTION
- Thee Role and Benefit of Standards
- Blockchain Governance
 - Tragedy of the Anti-commons
 - Data Governance
- Smart Contracts
- Interoperability
- Conclusion

INTRODUCTION

- Nakamoto paper (2008) principally based on Haber & Stonetta paper (1991).
- Paper identified a practical way to transfer value in non-face-to-face environments without the need to rely of third party.
- Blockchain can reduce friction costs by dis-intermediating third party involvement. (Coase 1991 Nobel Laureate)
- 2014 NY banker reda paper and substitute “coin” for “value”
- At law all property is identified as a bundle of rights.
- These rights can be expresses as information and therefore can be recorded in a blockchain.

BLOCKCHAIN ADVANTAGES

The blockchain has the following advantages:

- reliable and available to all participants
- transparent as all participants have read access
- immutable integrity is guaranteed
- deployed in non-face-to-face transactions
- time reduction between the transaction start and settlement
- covers any type of asset (intangible and tangible), not just bitcoin, e.g. diamonds, land, and securities
- reduces friction costs by disintermediating third party involvement

BLOCKCHAIN DISADVANTAGES

- Blockchains are simply a fairly dumb data repository that still require a software application layered on top to achieve any benefit.
 - Sir Mark Walport, UK Chief Scientist, says: “the implementation of distributive ledgers with embedded smart contracts should lead to substantial improvements in compliance, cost efficiency and accountability”.
 - Sir Mark is correct but as yet there is very few smart-contracts in place and further investigation needs to be undertaken.
 - Hence the disadvantage is the current lack of commercially oriented and robust smart contracts and the resources needed to implement them.
- The issue of smart contracts is discussed further on.

THE ROLE AND BENEFIT OF STANDARDS

- Standards: 3 types
 - Regional
 - National
 - International.
- Standards can assist in the diffusion of new technology by creating a common platform of understanding
- There are real economic benefits from Standards and their compliance and development.
- Consumers can readily trust the product or service that complies with a recognised standard.

BLOCKCHAIN GOVERNANCE

- Public vs Private blockchains.
 - Public Bitcoin, Ethereum.
 - Bitcoin has many stakeholders who have influence
 - Private blockchain
 - Hyperledger deployments.
- Internal and external aspects.
 - Internal” Tragedy of the anti-commons
 - SEGWIT
 - External
 - DISSTIBUTIVE NATURE OF THE LEDGER.

SMART CONTRACT GENESIS

- Nick Szabo first coined the term in a 1996 research paper.
- As Szabo noted: *“The basic idea behind smart contracts is that many kinds of contractual clauses (such as collateral, bonding, delineation of property rights, etc.) can be embedded in the hardware and software ..., in **such a way as to make breach of contract expensive** (if desired, sometimes prohibitively so) for the breacher.”* (emphasis added)
- *The real difficulty with this approach is that it is unenforceable at law.*

SMART CONTRACT GENESIS

- *Paciocco (High Court case 27 July 2016)*

“Equity regards a collateral provision designed to provide an incentive to perform a principal obligation as objectionable on the ground that its enforcement was unnecessary to give the promise the benefit of the substance of the transaction” per Keane J.

- *Hence Szabo’s initial position is not legal in Australia. Interestingly, US law is similar to that of Australia.*
- *Despite this there is a role for “smart contracts” in commerce.*

SMART CONTRACT GENESIS

- The concept took a long time to develop as there was not in 1996 a platform on which smart contracts could operate upon.
- The term smart contract is really a misnomer. Lawyers would call it a Humpty-Dumpty-ism.
- Smart contracts are neither smart nor are they a contract that would be recognised at law.
- Smart contracts are automated programs that transfer digital assets/rights within the block-chain upon certain triggering conditions.

SMART CONTRACT GENESIS

- Smart contracts are built on top of an underlying blockchain platforms such as Ethereum or Hyper-ledge or Cardana.
- Consequently, Smart contracts are pieces of code that monitor performance of a contract and will automatically deal with the rights of the parties who have formally contracted.
- This is where from a legal perspective that problems can arise.
- Noting that from a policy perspective it is not possible to oust the courts jurisdiction..

SMART CONTRACT GENESIS

- **Smart Contracts** are NOT the same as a contract recognised by the law. As Szabo proposed a smart contract makes it expensive for the defaulting party and thus assists in performance but such is not legal in Australia.
- A smart contract can enforce a functional implementation of a particular requirement like payment. Further they can evidence performance or non-performance.

SMART CONTRACT GENESIS

- It is likely that there will be sitting behind a smart contract a formal written agreement or some document which will make reference to the smart contract. ISDA agreements are a prime example.
- Offer and acceptance can ONLY be formed by entities recognised by law.
- Software or robots are NOT recognised at law as being legal entities.
- Natural persons, companies and statutory bodies are recognised at law.

SMART CONTRACT GENESIS

- **Smart contracts** do not need to involve artificial intelligence. This does not mean that AI will not in the future be involved. IBM for instance has through the hyper ledger project links a smart contract to Watson the power IBM AI machine.
- Hence smart contracts to be enforceable at law **MUST** relate to entities a that are recognised at law and must not be overly harsh to be enforceable at law.

SMART CONTRACT GENESIS

- **Smart contracts:** Lord Diplock in *Robophone v. Blank* stated every contract comprises primary obligations as well as secondary obligations. Secondary obligations arise upon a breach.
- At law it is not possible to enforce a penalty though it is possible to enforce liquidated damages.

SMART CONTRACT GENESIS

- The UK Supreme Court in *Cavendish* dealt with penalties recently.
- Lord Neuberger stated:

Equity regards a collateral provision designed to provide an incentive to perform a principal obligation as objectionable on the ground that its enforcement was unnecessary to give the promise the benefit of the substance of the transaction”.

SMART CONTRACT GENESIS

- As noted in Paciocco case:

*A stipulation will not constitute a penalty at law or in equity unless it is **extravagant or unconscionable** in amount in comparison to the greatest conceivable loss for the breach.*

- *It is not possible in this presentation to cover all aspects of legal requirements.*
- *As an example: Under the ASIC Act section 12CB needs to be considered.*

SMART CONTRACT GENESIS

- Section 12 CB provides:

*A person must not in trade or commerce in connection with the supply or possible supply of financial services to a person engage in conduct that is in all the circumstances **unconscionable**. (Emphasis added)*

- Hence Smart contracts to be enforceable must comply with the law.
- There are other legislative requirements such a Australian Consumer Law as well.

SMART CONTRACT GENESIS

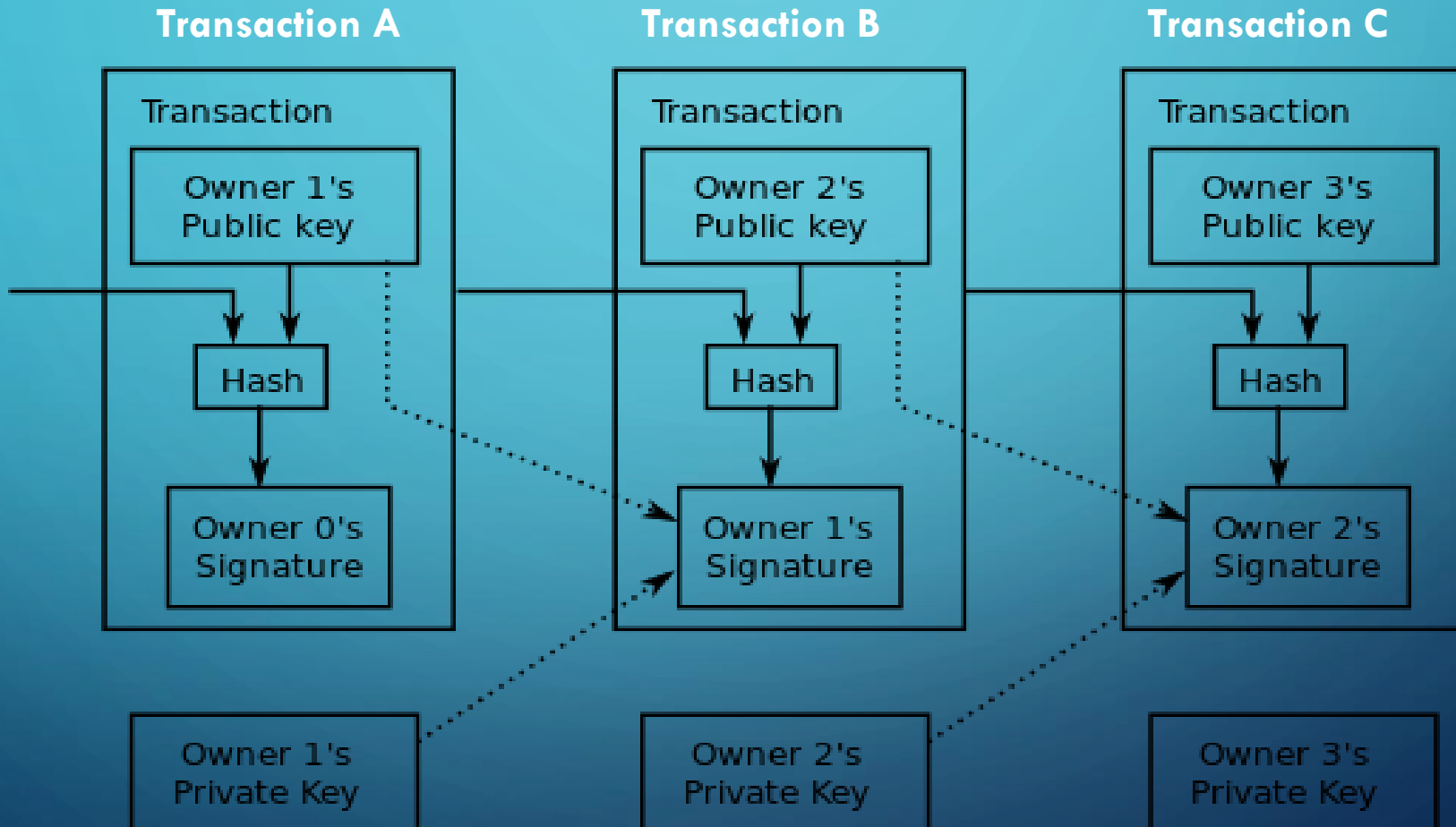
- **Smart contracts** in order to be adopted must be easily to program but the coding (SOLIDITY LANGUAGE) is still immature technology and quite complex.
- Special skill are currently required:
 - Legal knowledge with some technical knowledge;
 - Coding knowledge
- Hence, for now there needs to be the engagement of both skills for success.

SMART CONTRACT GENESIS

- **Smart Contracts** hopefully in the future will not require coders. It is hoped that the next generation of smart contracts will involve requirements checklists so that lawyers or non-coders can develop their own smart contracts.
- See Clack, Bakshi & Braine “Smart Contract Templates: Foundations, Design Landscape, and Research Directions”.

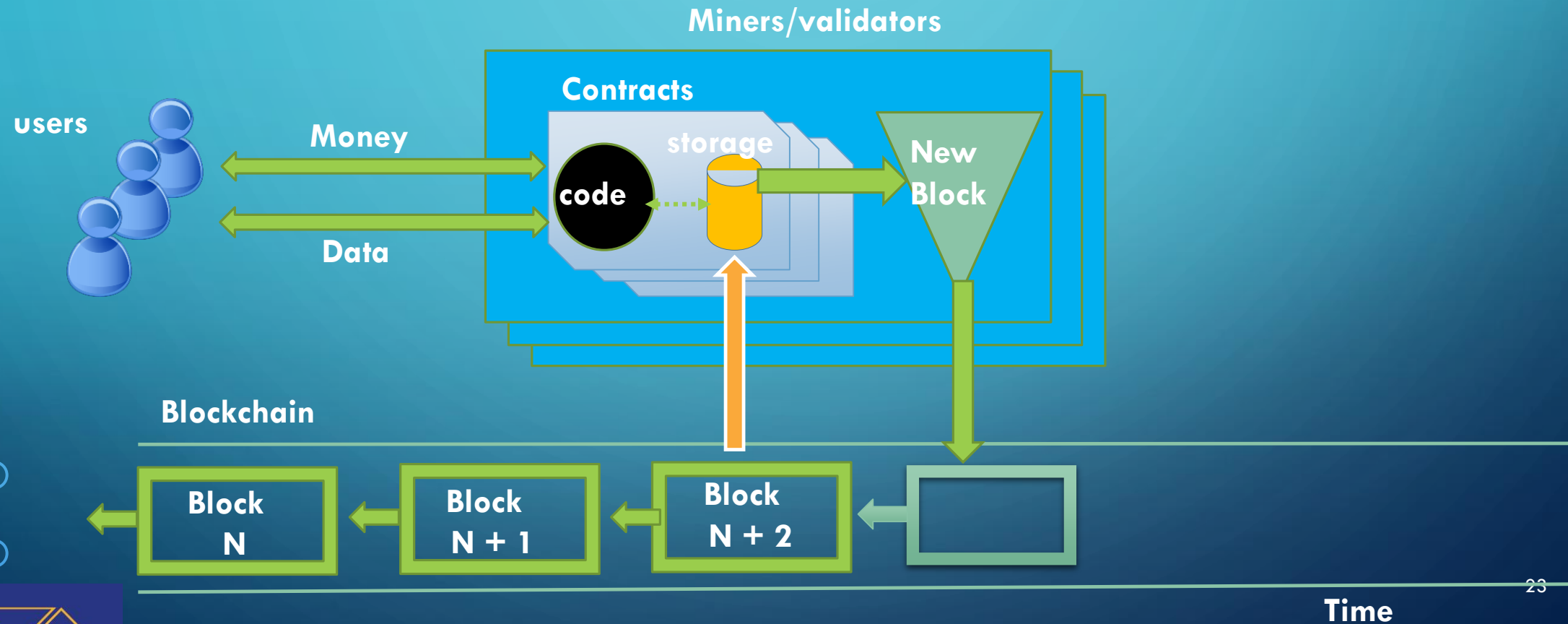
SMART CONTRACTS AND THE BLOCKCHAIN

A CRYPTOGRAPHICALLY CONNECTED TRANSACTION BLOCKS



SMART CONTRACTS AND THE BLOCKCHAIN

See Clack et al



INTEROPERABILITY

- Must avoid siloed environment.
- This is not lord of the rings with one blockchain to rule them all.
- Multiple blockchains will be established
- Interaction between blockchains will be inevitable.
- Need a solution to this interaction so that integrity and trust can be maintained.

CONCLUSION

- This is a discussion only presentation.
- A full paper has been completed which will be published shortly
- Interoperability will be a conundrum especially due to possible different consensus protocols being deployed.
- Need more resources to write secure and trusted smart contracts.