Blockchain Technology

VERMONT SECRETARY OF STATE

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Introduction

In Act 51 of 2015, the Vermont General Assembly decreed:

"On or before January 15, 2016, the Secretary of State, the Commissioner of Financial Regulation, and the Attorney General shall consult with one or more Vermont delegates to the National Conference of Commissioners on Uniform State Laws and with the Center for Legal Innovation at Vermont Law School, and together shall submit a report to the General Assembly their finding[s] and recommendations on the potential opportunities and risks of creating a presumption of validity for electronic facts and records that employ blockchain technology and addressing any unresolved regulatory issues."

Blockchain Fundamentals

A blockchain is an electronic ledger (register) of digital records, events, or transactions that are represented in condensed form known as a hash (digital security feature), authenticated, and maintained through a "distributed" or "shared" network of participants using a group consensus protocol (multiple users). (Vermont Report, 2016)

Purpose of Blockchain

Blockchain technology is: "system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party." (Nakamoto, 2008)

Blockchain is the technology that is most widely seen as the foundation of the **Bitcoin** e-currency, but other implementations have arisen and have been proposed.

Unpacking Blockchain Fundamentals

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Electronic ledger: a computer system that stores and tracks transactions
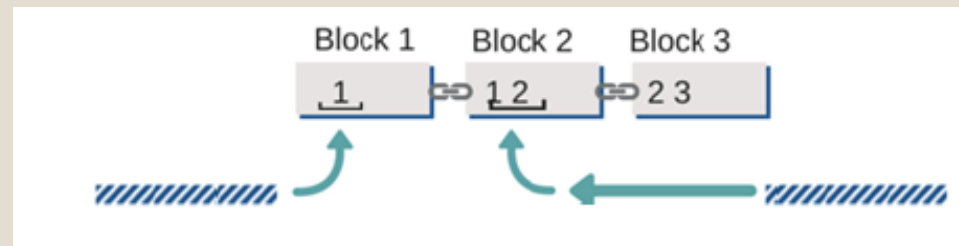 ◦ Compare to deed recording books, or financial accounting ledgers

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Digital records, events, or transactions: any event that is to be recorded in this system
- Chunks of transactions are known as **blocks**
- Examples: financial transactions (sales, accounts receivable, etc.), property transfers
- Each transaction has a link to previous transactions: security measure to know that it is valid

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Authenticated: The sender encrypts their transactions, and the network decrypts them. This uses the same technology implemented in e-commerce, e-banking, e-signatures, and more. Most importantly, this helps prevents identity theft between anonymous parties.

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Distributed: records in the blockchain are not stored in one centralized location; they are copied across hundreds or thousands of different locations

- Each location is known as a **"node"**

- Compare to having one copy of a ledger versus 100+ copies that are automatically updated simultaneously when a new entry is added. Redundant copies are more secure.

- Combats fraud by making it difficult to compromise; an attacker must corrupt 50% of the network as opposed to a single third-party or trusted source.

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Group consensus protocol: Multiple locations verify each incoming transaction (instead of one trusted third party); when enough agree that it is valid, it becomes the next entry in the ledger.
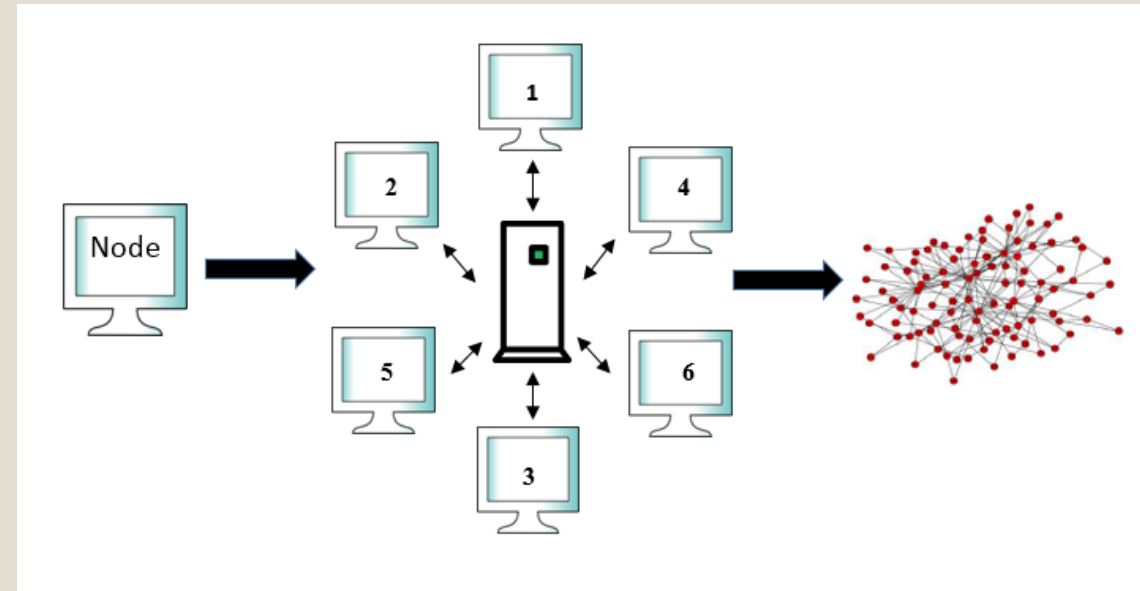
Trusted Third Parties

Trusted third party: even if the two parties to a transaction do not trust each other, the third party "brokers" the transaction since it is trusted by the original two.

Potential disruptive technology: many industries currently rely on or serve as trusted third parties to a transaction. Blockchain technology attempts to remove this third party and thus widespread adoption could reduce the need for these services.

Trusted Third Parties

Industries that rely on trusted third parties:
- Too many to list.

Industries that *are* trusted third parties:
- Banking
- Brokering
- Legal services
- Certificate authorities
- Professional licensing or certification

The State (and Federal Government) is often a trusted third party as well:
- Land recording
- Notary public
- Public recordkeeping generally

Public Records

Since the State serves as the custodian of public records, that "trusted third party" for everything from deeds, to UCC liens, to licenses, can this replace that function?

The State of Vermont found:

"At present blockchain technology adds little in terms of public recordkeeping. The records kept by the State are presumed reliable and accurate in terms of content. Moreover, effective records management policies and procedures by agencies should address the authenticity of records. The need to preserve copies of electronic records for long periods of time is already essential to state business and strategies and tools are in place to address these needs." (Vermont Report, 2016)

Legal Implications

The State of Vermont found:

- Blockchain technology can be used to reliably authenticate certain aspects of a transactional record
  - Who sent it
  - When it was sent
  - What was in it

- Blockchain technology provides no special benefit to verify the *validity* of the information inside that record

- Existing legal frameworks such as UETA (Uniform Electronic Transactions Act) already cover much of the anticipated usage for blockchain technology. Vermont recommended to explicitly allow "valid applications" of blockchain technology in its enabling legislation.

Legal Implications

Uniform Electronic Transactions Act

◦ Enacted in every state except WA, IL, NY

◦ Governs "electronic transactions" – of which blockchain transactions would be a candidate

◦ Uses an older understanding of technological transactions (drafted in 1999) – but still valid in most cases

◦ Vermont recommended updating UETA or other laws to account for systems that have no "controller"… i.e. distributed peer-to-peer systems

Vermont evaluated blockchain in the context of UETA and existing laws and found no conflicts. Though new language was not necessary, it was believed it could be helpful and reduce confusion.

Enabling Legislation

Act 157, effective July 1, 2016, contains blockchain language around:

◦ Presumption of validity as evidence

◦ Authenticity of fact or record verified through a valid application of blockchain technology

◦ Presumption is not to the truthfulness, validity, or legal status of the contents of the fact or record

◦ No obligation or duty for any person to adopt or otherwise implement blockchain technology

http://legislature.vermont.gov/assets/Documents/2016/Docs/ACTS/ACT157/ACT157%20As%20Enacted.pdf

Enabling Blockchain

◦ The public is already using it!

◦ Existing law (such as UETA) does not specifically prohibit it.

◦ No obligation to use this technology unless all parties wish to.

◦ There is great public interest in the technology, but it's unclear how to leverage it from a State perspective.

Conclusions

◦ Blockchain technology is still in its infancy (less than 10 years old)!

◦ Many proposed implementations; very few continuously successful ones.

◦ Only time will tell how the technology developed; there are still unanswered questions.

◦ Vermont is a place where this technology can flourish or fail – but the law won't make either of those happen.

References

James Condos, William Sorrell, and Susan Donegan. (2016) *Blockchain Technology: Opportunities and Risks*. http://legislature.vermont.gov/assets/Legislative-Reports/blockchain-technology-report-final.pdf

Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System.* Retrieved from https://bitcoin.org/bitcoin.pdf

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