IM 450-01 Issues in IM: *Blockchain, Cryptocurrency, NFTs*

Spring 2022

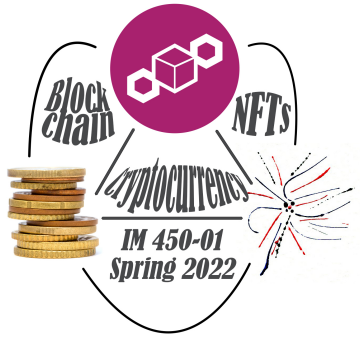
Class 3— January 27

Blockchain:

- What is the problem to which this technology is a solution?

-Whose problem is it?

-What new problems might be created by solving the original problem?



What problem(s) does Blockchain solve?

Proponents make claims such as:

“The main problem that blockchain solves results from the fact that computer databases simply cannot talk to each other without a layer of expensive fault-prone human administration or bureaucratic central authority controlling every node.

Blockchain technology, on the other hand, is a single, decentralized database managed by software and shared by multiple users, without any third party authority.

This makes processing transactions less costly and less error-prone.

This software enables process efficiency because new links can form as needed, and improves organizational efficiency because no management gatekeepers are needed.”

https://www.ingenesist.com/what-problem-does-blockchain-solve/

Goals for the technological features central to blockchains

- Decentralized networks (evade centralized authorities and bottle-necks).
- Immutablity (prevents double spends).
- Trust-by-consensus (trust is built into the network rather than “assumed” among human participants).
  - Raises accountability standards
  - Polices both the bookkeeping and the bookkeepers
  - Cryptographically secured transactions
- Faster & cheaper exchanges (than other methods of exchange & validation) by cutting out the middleman.
- User Anonymity. Lowers identity issues--protects identity and privacy

What is the problem to which this technology is a solution and Whose problem is it?

(illustrated by commonly proposed use cases; "advantages" are proponent CLAIMS

Notary Public (note: these are proponent CLAIMS)

Blockchain would eliminate the need for expensive notarization fees and ineffective ways of transferring documents.

- **Notaries are not always easy to find**
- **Notaries sometimes charge fees**

Verifying authenticity of the document can be done using blockchain and eliminates the need for centralized authority.

The document certification service helps in Proof of Ownership (who authored it), Proof of Existence (at a certain time) and Proof of Integrity (not tampered with) of the documents.

Since it is counterfeit-proof and can be verified by independent third parties these services are legally binding.

Using blockchain for notarization secures the privacy of the document and those who seek certification. By publishing proof of publication using cryptographic hashes of files into block chain takes the notary timestamping to new level.

Notary Public (challenging the claims critically)

Blockchain eliminates the need for expensive notarization fees and ineffective ways of transferring documents.

Notaries are not always easy to find; Notaries sometimes charge fees

Finding a notary and paying fees CAN BE/ARE problems for everyday people, especially without means or transportation. People with access and means would not find this advantage compelling.

Verifying authenticity of the document can be done using blockchain and eliminates the need for centralized authority.

This accomplishes little other than cutting out current notaries. No evidence that finding someone who can do blockchain tech would be easier.

The document certification service helps in Proof of Ownership (who authored it), Proof of Existence (at a certain time) and Proof of Integrity (not tampered) of the documents.

These are the among the basic functions of the notary. No evidence that blockchain can improve these.

Since it is counterfeit-proof and can be verified by independent third parties these services are legally binding.

This would re-introduce a middleman and undermines the point of using blockchain. Blockchains CAN BE HACKED.

Using blockchain for notarization secures the privacy of the document and those who seek certification. By publishing proof of publication using cryptographic hashes of files into block chain takes the notary timestamping to new level.

This is a NO GO. The purpose of the Notary is to attest to the identity of the person signing. Make the process anonymous and one obviates the central function and advantage of the notary.

Decentralized proof of existence of documents

Validating the existence or the possession of signed documents is very important in any legal solution. The traditional document validation models rely on central authorities for storing and validating the documents, which present some obvious security challenges. These models become even more difficult as the documents become older.

The blockchain technology provides an alternative model to proof-of-existence and possession of legal documents. By leveraging the blockchain, a user can simply store the signature and timestamp associated with a legal document in the blockchain and validate it anytime using native blockchain mechanisms.

Common citizens can have this problem with documents such as their original marriage license, death certificate, house deed, citizenship papers, etc.

Decentralized proof of existence of documents (challenging the claims critically)

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While true, keeping track of who holds a document is different than validating it. Most citizens still need secure holding and scans/copies don't count as originals in many/most circumstances. Most/many "legal" systems is require archived paper.

Copyright and royalties

Blockchain can play a role by maintaining a comprehensive, accurate distributed database of rights ownership information in a public ledger. In addition to rights ownership information, the royalty split for each work, as determined by "smart contracts" could be added to the database.

Artists of all kinds have this problem.

An even better problem to solve is the time it takes the copyright office to issue the rights. 3-6 months, and they don't do any searching for duplicates/previous registration (they let the parties and courts battle those out).

Blockchain could probably lower the registration time exponentially.

Copyright and royalties (challenging the claims critically)

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Middlemen play a role in collecting, holding, and distributing the funds, not just keeping track. It's not clear that sending the funds to an anonymous network, without central banking authority or oversight, would actually protect artists.

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Blockchain could probably lower the registration time exponentially.

Yes, it could.

Q&A? Blockchain:

- What is the problem to which this technology is a solution?
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Time allowing, articles in the syllabus

"In blockchain we trust"

- **Programmable money and smart contracts constitute a powerful way for communities to govern themselves in pursuit of common objectives.**
- **Still, this utopian, frictionless “token economy” is far from reality.**
- **Meanwhile, the centralized institutions that should be vulnerable to disruption, such as banks, are digging in.**
- **Just as few people in the mid-1990s could predict the later emergence of Google, Facebook, and Uber, we can’t predict what blockchain-based applications will emerge from the wreckage of this bubble to dominate the decentralized future. But that’s what you get with extensible platforms.**

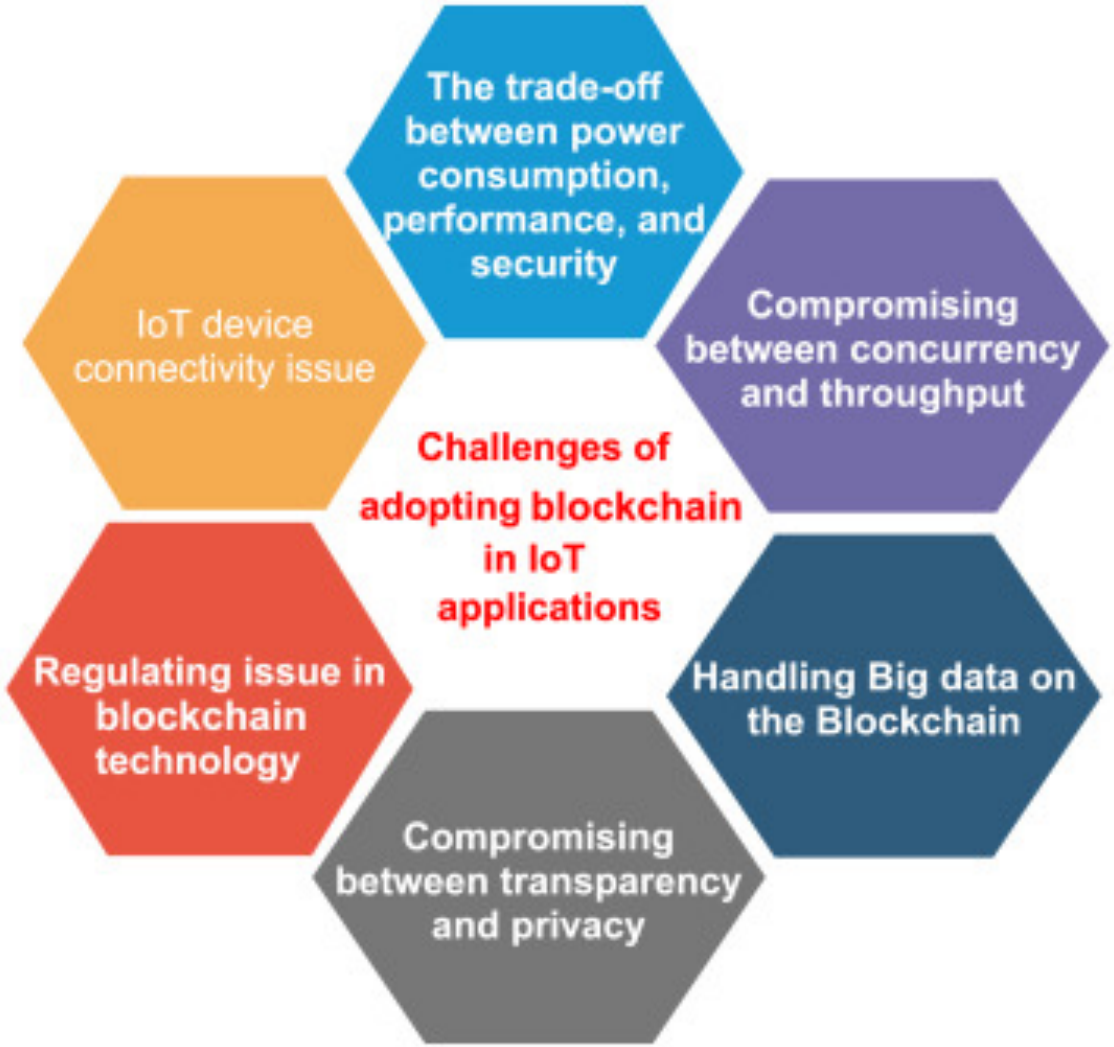
"Blockchain: The Good, The Bad and The Ugly"

- **The distributed ledger mechanism made possible by blockchain is so broadly applicable that it will enhance and improve the next generation of distributed and online services. Blockchain has the ability to decentralize choke points and ensure greater transparency than existing technologies**

- **What makes blockchain so important? Blockchain is applicable to any industry, business or capability that requires some sort of transaction. This means that there is significant potential for blockchain to change the way transactional trust is established.**

- **Breaches are a problem.**
  - **There are no provisions in blockchain that technically prohibit a dishonest group from controlling a majority of a blockchain.**
  - **Quantum computing might enable even more breaches.**

A survey on the adoption of blockchain in IoT: challenges and solutions



plus: have a look through the glossary/definitions portion of this document. The language challenges to lay people are ENORMOUS.

Digital Ethics and the Blockchain: Ethics and Disruptive Technologies

- **Blockchain Hopes and Expectations**
  - **Prosperity and Fairness**
  - **Integrity and Transparency**
  - **Privacy**
- **Technology tends to be neutral, not biased for or against fairness and other values such as sustainability, liberty or equality. Yet these values flourish in the presence of trust, and blockchains' decentralized architectures can enable applications to favor the many over the few. Newer blockchains may improve energy sustainability.10 If blockchains are built for integrity, privacy, security, distributed value and inclusion, economies and social institutions can be redesigned to be worthy of trust.**

What Are The Environmental Effects Of Blockchain Technology?

- **Running a blockchain has the potential to require a significant amount of electricity, particularly when mining cryptocurrencies.**
  - **have to be careful here as the negatives, to this point, seem most substantial around cryptocurrencies. Other use cases seem somewhat(way) less damaging. Of course, as they scale up . . .**

- **Even outside the context of blockchain, the increasing reliance on the servers needed to power blockchain takes an environmental impact. Servers themselves take up physical rooms in buildings and waste huge amounts of energy. Data centers, in particular, are very reliant on energy. A single data center can eat up more power than a medium-size town. Though, some companies, like Apple, Facebook, and Google, are already using renewable energy to power their data centers.**

- **Blockchain's Applications Can Still Aid the Environment**
  - **Blockchain could allow our economy to seek out truly sustainable processes without undergoing huge, complex changes. If it succeeds, then the world could be much closer to meeting the challenges of adapting to climate change than we realize.**