Digital Ethics and the Blockchain

How the digital transformation turns out may depend on how well it supports core values such as prosperity, fairness, integrity, transparency and privacy atop an Internet that erodes some of these values.

Many hope platforms built on blockchains will improve online ethics by providing the Internet’s missing trust layer.

Blockchain Primer

A blockchain is a form of digital ledger that records and widely distributes transactions while offering strong provisions for data integrity and availability. Different types exist. Some (such as Bitcoin’s) are highly decentralized, while others (such as the R3 Corda) are controlled by private industry groups. All promise to enable previously risk-prohibitive use cases. All are cryptographically protected to provide an immutable record of historical transactions and some support anonymous accounts. Figure 1 contains more information on blockchain, and its types, features and applications.

Ethics and Disruptive Technologies

Ethics are value systems societies create to govern behavior and activity. Technologies constantly destabilize legal, social and economic structures. For example, city regulations license taxi franchises in the name of public safety. Uber comes along with a safe, convenient and cost-effective alternative. Taxi companies protest. An ethical value judgment needs to be made: Is it more important to make Uber available for new drivers and passengers or to protect existing taxi drivers?

Digital ethics and societal ethics are becoming one. An ethical society cannot exist unless digital ethics catch up to society’s ideals. One can argue the Internet status quo tramples privacy and tilts the playing field toward large technology companies. Or that banks and other industries have followed the money and not served everyone well; globally, more than 2 billion people are unbanked and lack any digital identity.

Blockchain Hopes and Expectations

People tend to project their hopes and dreams onto new technologies. From the poem “All Watched Over by Machines of Loving Grace” to the early Internet and open-source technology movements, many have promoted ideas such as freeware, shareware and network neutrality. But somewhere along the line, the advertising-funded Internet came to look more like a tragedy of the commons than a technological utopia.

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value exchanges; the R3 consortium uses private distributed ledgers for interbank payments; Abra is a peer-to-peer remittances application based on Bitcoin that is improving life for some of the world’s most disadvantaged persons and countries.

Beyond financial services, blockchain technologies may transform healthcare, placing patients at the ecosystem center. PeerTracks plugs into the BitShares Music blockchain to reinvent an artist-centered music industry.

But blockchain technologies are also at the peak of an immense hype cycle. The market is rife with pump-and-dump cryptocurrency-fueled schemes.

Could this be changing? As written in Blockchain Revolution:

> If business, government, and civil society innovators get this right, we will move from an Internet driven primarily by the falling costs of search [and coordination]... to one driven by the falling costs of bargaining, policing, and enforcing social and commercial agreements, where the name of the game will be integrity, security, collaboration, the privacy of all transactions, and the creation and distribution of value.

**Prosperity and Fairness**

Blockchain promises to unlock value and improve the distribution of opportunity. Financial services are ripe for disruption. Blockchains’ ability to enable attestation of untrusting parties; dramatically lower costs; increase the speed of transactions; and provide microtransactions, microloans, crowdfunding and smart contracts offers incredible potential. Multiple players are competing for the opportunity: Ripple and Stellar use cryptocurrencies to enable seamless international transactions and

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**Figure 1—Blockchains and Distributed Ledger Primer**

**Blockchain Definition:** A form of digital ledger that records and distributes transactions while using strong data integrity, availability and cryptographically-protected immutable records.

**Types**

- **Permissionless**
  - Code is law.
  - No central authority
  - Massively distributed
  - Uses cryptocurrency
  - Energy-intensive
  - Example: Bitcoin, Ethereum

- **Permissioned**
  - Distributed authority
  - Nodes complying with a trust framework as validators
  - Energy-efficient
  - Example: Sovrin Foundation

**Consensus**

- **Public**
  - Federated consortia
  - State, community or privately operated
  - Open to all, but may be read-only

- **Private**
  - Consortium-run
  - Restricted members
  - Industry-specific
  - Energy-efficient
  - Example: R3, CU Ledger

**Features**

- Transaction recording
- Validation
- Decentralization
- Replication
- Anonymity, pseudonymity
- Access control
- Zero knowledge proofs
- Side chains
- Multichain

**Consensus**

- Proof of work
- Proof of stake
- Social
- Other methods

**Multichain:** “I expect in the long term we’ll see every possible combination of public and private emerge.”

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Implement more decentralized identity and access management (IAM) systems, and to keep a close accounting of end-user consent for the collection, sharing and use of personal data.

Decentralized IAM enthusiasts argue blockchains could provide sovereign identity, privacy and control along with secure, authenticated and verifiable transactions. uPort, Sovrin Foundation and SecureKey are building public, public/permissioned and private blockchains respectively, with privacy-enhanced capabilities such as zero-knowledge proofs. By creating a logically centralized store for identity hashes, pointers and services, IAM blockchains enable private data to be highly distributed, yet still useful.

Even once IAM blockchains are proven, it will take time for existing applications to adapt to their privacy-by-design models. Standards must also emerge to overcome identity infrastructure “chicken and egg” issues.

Conclusion

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. If blockchains are built for integrity, privacy, security, distributed value and inclusion, economies and social institutions can be redesigned to be worthy of trust.
Endnotes


2 Brautigan, R.; All Watched Over by Machines of Loving Grace, The Communication Company, 1967, USA


