

Executive Summary for the Blockchain National Forum

Bohyun Kim

CTO, University of Rhode Island Libraries

& President, Library and Information Technology Association

Blockchain, also known as distributed ledger technology (DLT), holds a great potential for both innovation and disruption. The adoption of blockchain also poses certain risks, and those risks will need to be addressed and mitigated before blockchain becomes mainstream.

Blockchain is the technology that underpins well-known decentralized cryptocurrency, Bitcoin. To simply put, a blockchain is a distributed digital ledger on a peer-to-peer (P2P) network. Blockchain records and keeps data [in the original state in a secure and tamper-proof manner](#) by its technical implementation alone, thereby obviating the need for a third-party authority to guarantee the authenticity of the data. Records in blockchain are kept in multiple ledgers in a distributed network instead of one central location. This prevents a single point of failure and secures records by protecting them from potential damage or loss. Blocks in each blockchain ledger are chained to one another by the mechanism called ‘proof of work.’ (For those familiar with a version control system such as Git, a blockchain ledger can be thought of as something similar to [a P2P hosted git repository](#) that allows sequential commits only.) This makes records in a block immutable and irreversible, that is, tamper-proof. In areas where the authenticity and security of records is of paramount importance, blockchain can lead to efficiency, convenience, and cost savings. For example, with blockchain [implemented in banking](#), one will be able to transfer funds across different countries without going through banks. This can drastically lower the fees involved, and the transaction will take effect much more quickly, if not immediately. Similarly, [adopted in real estate transactions](#), blockchain can make the process of buying and selling a property more straightforward and efficient, saving time and money.

The disruptive potential of blockchain lies in its aforementioned ability to render the role of a third-party authority obsolete, which records and validates transactions and guarantees their authenticity should a dispute arise. In this respect, blockchain can serve as an alternative trust protocol that decentralizes traditional authorities. Since blockchain achieves this by public key cryptography, however, if one loses one’s own personal key to the blockchain ledger holding one’s financial or real estate asset, for example, then that will result in the permanent loss of such asset. With the third-party authority gone, there will be no institution to step in and remedy the situation.

This is only some of the issues with blockchain. Other issues include (a) interoperability between different blockchain systems, (b) scalability of blockchain at a global scale with large amount of data, (c) potential security issues such as [the 51% attack](#), and (d) [huge energy consumption](#) that a blockchain requires to add a block to a ledger. Note that the last issue of energy consumption has both environmental and economic ramifications because it can cancel out the cost savings gained from eliminating a third-party authority and related processes and fees.

There are growing interests in blockchain among information professionals, but there are also some obstacles to those interests gaining momentum and moving further towards wider trial and adoption. One obstacle is the lack of general understanding about blockchain in a larger audience of information professionals. Due to its original association with bitcoin, many mistake blockchain for cryptocurrency. Another obstacle is technical. Since the use of blockchain requires [setting up and running a node in a blockchain network such as Ethereum](#), a barrier to entry is high to those who are not familiar with command line scripting but simply want to try out and tests how a blockchain functions. The last and most important obstacle is the lack of compelling use cases for libraries, archives, and museums. To many, blockchain is an interesting new technology. But even many blockchain enthusiasts are skeptical of its practical benefits at this point when all associated costs are considered. Of course, this is not an insurmountable obstacle. The more people get familiar with blockchain, the more ways people will discover to use blockchain in the information profession that are uniquely beneficial for specific purposes.

In order to determine what may make a compelling use case of a blockchain, the information profession would benefit from considering: (i) what kind of data and records must be stored and preserved exactly the way they were created, (ii) what kind of information is at a great risk to be altered and compromised by changing circumstances, (iii) what type of interactions may need to take place between such data and records and their users, and (iv) how much would be a reasonable cost for implementation. These will help connecting the potential benefit of blockchain with real-world use cases and take the information profession one step closer to its wider testing and adoption.