Protecting Governments' Data

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The Blockchain Buzz

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NEW TO BLOCKCHAIN?

Blockchain, a type of distributed ledger technology (DLT), was originally created in 2008 to solve the "double spend" problem when transferring assets electronically, without relying on third parties. DLT is defined as a "distributed database maintained over a network of computers connected on a peer-to-peer basis, such that network participants can share and retain identical, cryptographically secured records in a decentralized manner."[1] The technology has since received a great deal of attention in its ability to increase speed and transparency; reduce fraud and error; and enhance security when making electronic transactions. Mainstream adoption of the technology, however, remains a challenge. An unclear regulatory framework, lack of standards, interoperability and the overall unproven nature of the technology remain impediments to adoption.

If you attended AGA's 2017 Professional Development Training (PDT) you probably came to a similar conclusion as I did: these are exciting times for financial management. Over the course of four days, we learned of new challenges our community will face, as well as novel approaches and solutions we can use to solve some of our most pressing problems.

One of the technologies that caused a buzz during PDT was blockchain. There has been a lot of attention and interest in blockchain technology because of its ability to eliminate the "middle man" and reduce the amount of time and money it takes to process electronic transactions. The magic primarily resides in the technology's innovative way of validating transactions and achieving network consensus. Through a combination of sophisticated math and the collaborative work of the participants in the network (called nodes), it is now possible for two people to transfer digital tokens of value without trusted intermediaries having to clear and settle the transaction. What used to take days in some cases can now occur in minutes, or even seconds.

Most people are probably familiar with blockchain as the technology that underpins Bitcoin and other forms of digital cash broadly referred to as cryptocurrencies. But this technology is more versatile than what immediately meets the eye. In addition to its ability to improve efficiency, blockchain — or,

more broadly, distributed ledger technology (DLT) — offers additional benefits that our community should consider, such as security, network resiliency, transparency and automation. In other words, our pursuit of improving efficiency may result in being better overall stewards of our data and information.

By isolating some of the main features of DLT, you begin to see where some of the potential value resides.

- **Public key cryptography:** Transactions are made using key pairs — one that is public and one that is private. Network participants can reasonably assume transactions are valid because the digital signature — which serves as a kind of password and can only be seen by the signatory — is mathematically linked to the public signature. One of the main benefits of public key cryptography is security. Through the use of digital signatures and encryption, network participants can be reasonably confident in the authenticity and confidentiality of transactions.

- **Shared/replicated ledger:** Transactions made within a distributed, peer-to-peer network are updated on a ledger automatically as changes occur; network participants can view and download a copy. Benefits of this feature include transparency at a granular level as well as network resiliency: the ledger is replicated

DLT FEATURE	POTENTIAL BENEFITS FOR FINANCIAL MANAGEMENT
Network consensus	Efficiency
Public key cryptography	Security
Transparent/replicated ledger	Transparency System resiliency/system availability
Programmable	Automatable

and synchronized many times over, making it impossible for the network to have a single point of failure.

- **Programmable:** Transactions can be programmed to self-execute based on logic or criteria known as "smart contracts." Through smart contracts, the network can be automated reducing the need for human intervention. Rules could be created at the transaction level to further enhance efficiency and security of the network.

As the financial management community begins to peel back the layers of this technology and understand its applicability and uses, we have an opportunity to tackle some of our most pressing challenges. Although we cannot yet pinpoint how blockchain technology will be used, there are strong indications that it "could drastically enhance, optimize and improve financial reporting and auditing."[2]

In addition, we should seek to understand how DLT could be used to:

- reduce fraud and documentation errors that contribute to improper payments;

- provide for a more robust and real-time audit trail;

- combat cyber crime;

- better manage and track both physical and digital assets, such as equipment and software licenses;

- address the challenges faced related to intragovernmental differences; and

- safeguard digital identities to better serve the public.

Conclusion

Whether this nascent technology will live up to its hype remains to be seen. Regardless, financial management community should note the promise this technology holds for improving efficiency and transparency, while making us better stewards of federal data and information. To fully understand how DLT will impact our community, we must start developing relevant use cases, proofs of concepts and pilot projects. But testing is only the start of the solution.

Creating venues — such as the AGA Blockchain Working Group — to share concepts, use cases and results will prevent us from duplicating work, and keep us abreast of successes and failures. ◘

Endnotes

1. GAO. *Financial Technology — Information on Subsectors and Regulatory Oversight* (GAO-17-361) April 2017, p40; and Financial Industry Regulatory Authority, *Distributed Ledger Technology: Implications of Blockchain for the Securities Industry,* January 2017.

2. Blockchain For Audit To Be Tested By US Congress-Supported Nonprofit," *The CoinTelegraph,* May 12, 2017.

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