

BLOCKCHAIN: WHAT IS IT?

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“Blockchain” first emerged as the technology underlying the bitcoin digital currency. Blockchain is a decentralized electronic ledger that is constantly growing as “blocks” of data are added to it, recording new transactions. Each user gets a copy of the blockchain downloaded automatically, and new blocks are shared with everyone. Blockchain provides complete information about transaction addresses and balances, from the original “genesis” block to the most recently completed set of transactions.¹

Blockchain uses cryptography to enable each user to add to the ledger in a secure way. As a new transaction occurs, both parties must verify its authenticity by consensus before it is recorded in a block. This eliminates the need for a central authority to monitor and validate transactions, instead relying on the consensus of the participants.²

What’s interesting about blockchain is that this “backroom” technology framework may prove to be more important than bitcoin itself. As businesses struggle to address security and data management issues for e-commerce and other challenges, blockchain may prove to be the answer.³ By securely conducting digital transactions and engaging trust without the intervention of a middleman, blockchain has the potential to simultaneously cut costs, reduce transaction time and decrease fraud risk.⁴

Full-scale deployment may be years away, but blockchain is attracting investment across several industries. Banks and financial services firms have shown the greatest interest, particularly for stock trading. Companies in other industries also are experimenting with this emerging technology platform.

Technology experts are excited about blockchain for the following reasons:

- **Commerce** — For the financial services industry, it is expected that blockchain could reduce annual global banking costs by as much as \$20 billion.⁵ Technology startups are exploring new automated, programmable functions such as “smart contracts,” agreements that are automatically executed with no human intervention once pre-defined conditions are met. The insurance industry could use smart contracts for plans offering short-term coverage, such as travel insurance.
- **Security** — A major attraction of blockchain is how it can create a registry that traces ownership and transaction history, and certifies origin.⁶ This function reduces the risk of fraud and is especially attractive for big ticket transactions such as real estate, fine art and diamonds. Insurance giant Allianz is working with startup company Everledger to develop a blockchain to track the life cycle of diamonds from mining through retail sales. Because unique characteristics and details of the diamond can be encrypted and replicated on all blockchain records, the authenticity certification cannot be compromised and the potential for fraud is significantly reduced.⁷



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- **Transparency** — As an open platform, blockchain will enable companies to share information in a very broad way with all participants. Once an entry is made into the transaction block, it cannot be altered or removed — so it must be accurate. Recorded data are widely available, making it imperative that companies load accurate information about their products and services into the blocks.⁸
- **Data management** — As a distributed platform, each user in blockchain is responsible for maintaining the accuracy of its own information for its transactions. Any kind of data can be stored permanently and it cannot be altered.⁹ This creates a permanent record that is authenticated and accessible on a broad scale. The music industry, for instance, could use blockchain to improve the royalty payment process and help reduce piracy.

There are challenges to developing this new technology — the main one being cost. Financial services companies are investing nearly \$1 billion in testing new applications.¹⁰ Some remain suspicious of blockchain due to its origin with bitcoin and that virtual currency's past association with the Silk Road online black market and other questionable practices. Still, technology experts across industries are excited about the potential for blockchain technology to be a fast and secure open framework for e-commerce and other applications.

To discuss these topics in more detail, please contact your PNC Relationship Manager.

¹ Investopedia definition of blockchain, available at: <http://www.investopedia.com/terms/b/blockchain.asp>.

² "CIO Explainer: What Is Blockchain?" by Steven Norton, *The Wall Street Journal*, Feb. 2, 2016. Available at: <http://blogs.wsj.com/cio/2016/02/02/cio-explainer-what-is-blockchain/>

³ "CIO Explainer: What Is Blockchain?" by Steven Norton, *The Wall Street Journal*, Feb. 2, 2016. Available at: <http://blogs.wsj.com/cio/2016/02/02/cio-explainer-what-is-blockchain/>.

⁴ "Blockchain: Catalyst for Massive Change Across Industries," by Kim S. Nash, *The Wall Street Journal*, Feb. 2, 2016. Available at: <http://blogs.wsj.com/cio/2016/02/02/blockchain-catalyst-for-massive-change-across-industries>

⁵ "Blockchain: Catalyst for Massive Change Across Industries," by Kim S. Nash, *The Wall Street Journal*, Feb. 2, 2016. Available at: <http://blogs.wsj.com/cio/2016/02/02/blockchain-catalyst-for-massive-change-across-industries/>

⁶ "Block chain startups signal new approaches to data integrity," by Robert Richardson, *Techtarget.com*, June 2015. Available at: <http://searchsecurity.techtarget.com/opinion/Block-chain-startups-signal-new-approaches-to-data-integrity>

⁷ "Blockchain: Catalyst for Massive Change Across Industries," by Kim S. Nash, *The Wall Street Journal*, Feb. 2, 2016. Available at: <http://blogs.wsj.com/cio/2016/02/02/blockchain-catalyst-for-massive-change-across-industries/>

⁸ "Why the Blockchain Revolution Won't Happen Overnight," by Andrew Deichler, *Association for Financial Professionals*, March 14, 2016. Available at: http://www.afponline.org/pub/res/news/Why_the_Blockchain_Revolution_Won_t_Happen_Overnight.html

⁹ "Block chain startups signal new approaches to data integrity," by Robert Richardson, *Techtarget.com*, June 2015. Available at: <http://searchsecurity.techtarget.com/opinion/Block-chain-startups-signal-new-approaches-to-data-integrity>

¹⁰ "Blockchain: Catalyst for Massive Change Across Industries," by Kim S. Nash, *The Wall Street Journal*, Feb. 2, 2016. Available at: <http://blogs.wsj.com/cio/2016/02/02/blockchain-catalyst-for-massive-change-across-industries/>

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