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While the claims regarding blockchain have been bold, the technology is being used to address specific challenges. IDC has documented more than 400 implementations of blockchain technology worldwide.

Enterprise Blockchain and Digital Transformation: Changing the Conversation

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Written by: James Wester, Research Director, Worldwide Blockchain Strategies

Introduction

There have been few topics in the past five years that have received more attention from the technology press and analysts than "blockchain," a term that has come to encompass technologies such as distributed ledgers and cryptocurrencies. The claims regarding the technology have been bold, with assertions that it will disrupt every vertical industry and region. It would be easy to dismiss many of the claims as hyperbole, but blockchain has characteristics that make it very different from current technologies. Those differences make blockchain significant and an important topic that technology and business leaders within enterprises should understand.

AT A GLANCE

KEY STATS

According to IDC:

- In 2019, blockchain spending will reach $3 billion, an increase of 88.7% from 2018.
- By 2022, blockchain spending will reach $12.4 billion for a five-year CAGR of 76%.

WHAT'S IMPORTANT

By providing a decentralized data store — one that can be accessed by multiple network members across trading relationships, value chains, or industries — blockchain enables enterprises to approach data in a very different manner and rethink legacy business processes such as invoice payment or inventory tracking.

The Blockchain Difference

As mentioned, the technology often referred to as "blockchain" comprises multiple technologies, including distributed ledgers, cryptocurrencies, and tokens. This lack of precision in terms and definitions is one of the reasons why some of the hype surrounding blockchain has been able to proliferate. Thus, it is important even for those who may be more familiar with blockchain to have a common understanding of what blockchain is as well as what makes blockchain so different.

At its most basic level, blockchain refers to a distributed database, or ledger, that exists across multiple participants in a peer-to-peer network arrangement. That means there is no single, central repository storing the database. Nodes within the network contain a duplicate of the entire database and make it available to network users. Each participant in the peer-to-peer network can see the data.

Distributed databases are not necessarily a new technology, but along with distributing the data across participants, blockchain also distributes the ability to change the database (i.e., recording transactions) across participants. Mechanisms that are a part of the ledger's basic protocols manage the validation and recording of changes to the

database. There are a number of methods for validating changes, but they are all designed to reach consensus on what can be added to the database.

An important factor with blockchains is the blockchain itself (i.e., a chain of blocks of data that is automatically built at regular intervals). These blocks of data contain information related to changes that have been made to the ledger (i.e., transactions) since the last block was created. Additionally, each block contains a "hash," a cryptographically generated string of data, derived from the data in the previous block. Thus, each new block is secured and linked to the previously created block. In that way, a blockchain becomes an immutable record of all transactions and changes ever made to the database.

What makes these characteristics so important is that they eliminate not only the need for third parties to provide centralized database, infrastructure, and storage solutions but also the costs associated with those third parties. Additionally, blockchain provides trust between parties — even where parties may be unknown to each other — thus eliminating the need for risk mitigation services and the fees charged by third parties to provide those services. In short, blockchain, by providing a decentralized, immutable record, reduces or eliminates many of the costs associated with running a database or ledger where multiple parties interact or connect with each other.

But blockchain is not just about reducing costs. By providing a decentralized data store — one that can be accessed by multiple network members across trading relationships, value chains, or industries — blockchain enables enterprises to approach data in a very different manner and rethink legacy business processes such as invoice payment or inventory tracking. Blockchain can also change how enterprises collaborate with suppliers, partners and customers. Additionally, it opens possibilities in using that data to find new and better ways to reach customers. Blockchain, by removing data silos and ensuring that members of a network are seeing the same validated information, means enterprises have a more complete, more comprehensive view of their data.

Permissioned Versus Permissionless Blockchains

To date, blockchains have evolved for enterprise use cases in two different ways: permissioned and permissionless. The difference between the two lies in how consensus on changes to the database is managed. With permissioned blockchains, also referred to as private blockchains, the ability to participate in a network is limited to allow only known partners. An example of this would be trading partners or vendors and their customers sharing access to a blockchain network. Permissionless or public blockchains, on the other hand, allow access to any participants who want to use the network. Bitcoin and Ethereum are two well-known examples of public blockchains. An important point about so-called public blockchains is that the data contained within them is not necessarily open to scrutiny by all participants. Depending upon how the network is used, the data is still encrypted and protected.

While permissionless blockchains have captured the most attention, enterprises looking to exploit blockchain technology have been more interested in permissioned blockchains because they provide the most control in determining access, governance and consensus models, and scalability. Plus, they are the best understood at this point in terms of supporting actual enterprise use cases. Additionally, regulated industries such as financial services and telecommunications have more readily embraced permissioned blockchains because they eliminate many potential regulatory issues relating to data storage and access.

Enterprises are beginning to understand the capabilities and disruptive potential of blockchains, whether permissioned or permissionless. Investment in the technology has been growing quickly. According to IDC's Worldwide Blockchain

Spending Guide, spending on blockchain solutions will reach nearly $3 billion in 2019, an increase of 88.7% from 2018. What's more, spending on blockchain over the next five years will grow at a compound annual growth rate (CAGR) of 76.0%, reaching $12.4 billion by 2022.

The majority of spending on blockchain is being done by financial services providers, with more than $1 billion spent to support banking, securities, and insurance use cases. An example of a financial services use case is cross-border payments, which will see $453 million in investment this year alone. Manufacturing use cases include lot lineage/provenance (i.e., tracking the chain of custody of goods and materials) and asset/goods management. In addition, identity management use cases will receive significant investments from the banking, government, and healthcare provider industries.

From a regional standpoint, the United States is leading in blockchain spending. In 2019 alone, the United States will spend $1.1 billion on blockchain. However, other regions are making healthy investments in blockchain as well. Western Europe, for instance, will see $674 million in blockchain spend in 2019, according to IDC's Worldwide Blockchain Spending Guide.

Factors for Enterprises to Consider Before Embracing Blockchain

Financial services and manufacturing are only two examples of blockchain implementations moving into production to improve certain industries. Given these implementations, as well as the overall interest and investment in blockchain to date, it might appear that blockchains for enterprise applications are guaranteed to succeed. However, significant obstacles could slow blockchain adoption. For instance, there is still doubt as to how quickly enterprises will build or join networks or consortiums developing blockchains. The business cases for a distributed database are also not straightforward calculations because the costs may be shared but the benefits may not accrue equally to participants. More experience in deploying the technology may be required for participants to develop business cases.

Along with issues regarding business cases, there are still questions regarding standards for building blockchains. At the moment, multiple governance models and protocols are in development, each with its own benefits and drawbacks. Many of the protocols are being built by consortiums of vendors and are developing very slowly, so any issues in adopting them may not be fully realized yet. That has caused many enterprises — even those interested in deploying blockchain — to take development slowly.

A similar issue to standards involves questions regarding the ability for blockchain to scale. Can blockchain meet the needs of the many use cases that have been identified as possible applications for the technology? For instance, cross-border remittances cover more than $600 billion. Can blockchain reliably handle that volume of transactions? Another example is use cases involving identity, where people, property, or connected devices are recorded on a blockchain. Can blockchains operate at the scale required to manage billions of identities or connected devices?

Examples of Blockchain Deployments

Yet organizations are addressing many issues and are going forward with deploying blockchains. While it is exciting to look at the growth and adoption of blockchain, general discussions on spending and capabilities do not show just how powerful blockchain can be. For that, it is important to look at how the technology is being used to address specific challenges. Indeed, one of the biggest questions about blockchain in these early stages is whether or not it is truly being implemented for real-world applications. The answer to that question is a resounding yes. In fact, IDC has documented more than 400 implementations of blockchain, from small proofs of concept to pilot programs to full production implementations across multiple industries and verticals such as financial services, healthcare, and telecommunications.

An important implementation demonstrating the value of blockchain has been launched in India. Considered the world's largest consumer blockchain network, the permissioned blockchain comprises 800 million telecommunications customers and is intended to protect consumers by obscuring their phone numbers and any personally identifiable information. Instead, members of the network — including the government and telecommunications providers — store only a virtual number in the blockchain, allowing for the sharing of account information but preventing personal information from being used for annoying spam or robocalls.

As mentioned, the financial services sector is readily adopting blockchain technology for multiple use cases. One such example is blockchain for cross-border remittances. The current method for sending money across borders requires access to money transmitters or financial institutions at both ends of a transaction connecting to one of several bank networks. For many consumers, especially those who may be low income, access to such institutions comes at a steep price. The World Bank currently estimates that money transmitters on average charge consumers fees of more than 7% of a transaction's value to send money across borders. Additionally, with current methods for money transmission across borders, it can take several days before the funds are available to a recipient. (The delay is even longer when money is sent across less common remittance corridors.) With blockchain as a backbone, money transmitters around the world have been able to distribute their remittance networks, lowering fees considerably and making funds available to recipients almost immediately.

Another financial services use case involves lines of credit for businesses using a distributed funding model. The blockchain allows participants in the network to access credit from multiple parties that can also identify and calculate risk in their credit offers thanks to information shared across the network. The cost of capital can be adjusted dynamically depending on information about the businesses seeking capital. The arrangement not only creates a market for credit but also lowers the risk to underwriters by spreading the underwriting decisions to other credit providers in the network. It also prevents duplicate credit requests and helps identify false claims. In addition, the arrangement encourages businesses seeking credit to manage their capital wisely because information on repayment and risk is shared to the blockchain and thus the multiple underwriters.

The supply chain has also found blockchain to be a useful technology. With blockchain, manufacturers, suppliers, shippers, and others can trace components and raw materials through the entire manufacturing process, ensuring that parts can be traced back to a point of origin in case of a product recall or malfunction. TradeLens, a blockchain network for global shipments, has been adopted by dozens of global carriers, customs authorities, freight forwarders, and port authorities. The effort is aimed at increasing visibility across goods shipments, allowing partners to track their shipments more closely, as well as decreasing shipping times and increasing efficiency as shipments traverse global routes.

Considering Tech Mahindra

With so much investment and interest in blockchain, it is no surprise that many technology vendors are beginning to build blockchain product offerings. There is a very real sense that blockchain represents a completely new — and disruptive — delivery model for enterprise software, and vendors across the spectrum are looking to build solutions that harness that new model.

Consider a supply chain where each participant currently pays a license for software that manages only its portion of the chain — the portion that sees where inputs enter into its inventory and outputs are subsequently sent to its customers. Each member of that value chain interacts with partners immediately upstream and downstream. Companies that have digitally transformed their processes to include open, modern systems may interact with their immediate partners

automatically via APIs, but even the most updated legacy systems — the software and databases used to manage their discrete portion of the supply chain — are still effectively silos of information. Those systems are blind to changes in the supply chain once outside of those parts of the supply chain.

With blockchain, all members of a supply chain, from end to end, can see changes as they happen. They are no longer blind to changes upstream or downstream that may affect timing and availability of parts or inventory or delays in shipping that may affect invoice payments. Plus, the need for every member of the supply chain to have its own licensed version of a software package — many times from the same vendor — to manage its own unique database is reduced. Again, this completely changes the way in which enterprise software is packaged and delivered.

This disruption of the traditional software delivery model is why traditional technology services vendors andsystems integrators such as Tech Mahindra are becoming strong competitors in the blockchain space. Their talent is in linking systems together, and there is a deep understanding of how enterprises need to integrate new technologies into existing processes to arrive at useful solutions that solve real problems.

Additionally, such companies give their customers access to a wide variety of technology solutions and approaches, allowing enterprises to get the maximum benefit from technology without being forced to choose between competing solutions. This is especially important with an emerging technology such as blockchain where standards, protocols, and networks are still forming. With Tech Mahindra as a partner in creating blockchain solutions, enterprises can begin to experiment with the technology without a concern that their solution will become outdated before it is even completed.

Because of the unique characteristics of blockchain, systems integrators that are experienced in creating useful solutions out of disparate systems and on top of new technologies such as blockchain have the strongest position in this new market. (It is also why professional services is one of the fastest-growing segments in the blockchain market, with IDC predicting that spending by firms in the professional services industry will rise from $180.6 million in 2019 to more than $828 million in 2022.)

Conclusion

Even with various cautions, the ability of blockchain to disrupt multiple industries, lower costs, and increase efficiencies should encourage technology leaders within enterprises to understand the technology. In addition, blockchain offers companies an approach to digital transformation that is not just about digitizing current processes; it allows enterprises the ability to rethink the processes that have been built on legacy technology. Blockchain can help build entirely new customer experiences based on a more complete view of the customer using data that is common and accepted between multiple vendors and suppliers. Technology leaders within enterprises, especially those who have been reluctant so far to adopt blockchain, should begin not only to understand the technology but also to actively seek out vendors and partners that are using the technology. They should investigate how blockchain changes the digital transformation discussion and can be used to build new processes and customer experiences. They should also look at how industry consortiums, competitors, and regulators are beginning to build out networks, especially networks that are developing within their industries.

The ability of blockchain to disrupt multiple industries, lower costs, and increase efficiencies should encourage technology leaders within enterprises to understand the technology.

While the noise around blockchain has been extreme recently, that should not detract from the very real potential represented by the technology. Within certain use cases, blockchain and distributed ledgers have already begun to show impressive results that bode well for the technology to continue to be adopted. Senior technology leaders can no longer take a wait-and-see approach to blockchain. They should recognize that now is the time to begin embracing the technology.

About the Analyst

James Wester, *Research Director, Worldwide Blockchain Strategies*

James Wester's cross-industry practice covers the emerging distributed ledger and blockchain technologies. Mr. Wester's core research examines the technologies, architectures, and concepts behind blockchain and how they will be potentially revolutionary for financial services, manufacturing, energy, government, and healthcare.

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IDC Corporate USA

5 Speen Street
Framingham, MA 01701, USA

T 508.872.8200

F 508.935.4015

Twitter @IDC

idc-insights-community.com

www.idc.com