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OCTOBER 10, 2017

BLOCKCHAIN

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WHAT IS BLOCKCHAIN?

Blockchain is a shared digital ledger that holds records of business transactions in such a way that makes them accessible and visible to multiple participants in a network, while keeping them safe and secure.

Gartner positions blockchain distributed ledger technologies on the "peak" of its Hype Cycle for Emerging Technologies for 2017, meaning that they believe "blockchain will have a transformational impact on business" and industries [1]. And while this technology is rapidly being adopted in the financial services industries, the good news for Supply Chain is that we're next in line.

HOW DOES IT WORK?

At its core, blockchain brings together an ecosystem of partners who all choose to collaborate to address inefficiency. There are four tenants of the technology that everyone needs to understand:

1. Shared, Immutable Visibility

Events that are posted to a blockchain digital ledger are shared among the network participants, and each party has their own copy of the ledger. In this way, all trading partners on the network have the same view of what is and has happened.

In addition, the digital ledger is immutable. That means that data can only be added to it. Existing events cannot be changed or deleted. This is also referred to as an 'append – only' model, and will greatly reduce the 'he-said, she-said' of supply chain.

2. Privacy

Blockchain technology leverages years of research and development in cryptography. Each document or event posted to the blockchain ledger is wrapped in a security layer, and that layer is designed to know which participants are permissioned to open that wrapper and view the document.

Blockchain privacy also leverages distributing computing. Because each participant has their own copy of the ledger, and may move it to their cloud, their server, or their workstation, it's important that the security wrapper travel with the piece of data no matter where it goes.

3. Smart Contracts

Blockchain smart contracts are not legal documents so don't think of it that way. Instead, think about the rules that govern a transaction and the business logic that must be executed to determine if the transaction should be allowed to be posted to the blockchain. For example, "invoices should reconcile to purchase orders", or "only registered agents should be able to post signed documents". Smart contracts are the business terms embedded in the transaction database that get executed when transactions are being posted.

"As a supply chain practitioner, I'm most excited about 2 things: 1) a shared, permissioned ledger, and 2) an immutable record of events."

4. Trust / Consensus

Here again, blockchain leverages cryptography. When an event is published to the ledger, the algorithms do a couple of things. First, the identity of the participant publishing the transaction is validated by other participants. Second, the solution can require the event or transaction itself to be validated by others. The rules that are created and how strict they are (what % of network participants need to validate the identity or the event) are variable and should be designed based on the business situation the solution is addressing.

WHAT ARE THE OPPORTUNITIES?

As a supply chain practitioner, I'm most excited about 2 things: 1) a shared, permissioned ledger, and 2) an immutable record of events. Having worked in IBM's own supply chain and for a few of IBM's clients that outsourced supply chain operations to us, I have all the bruises and scars that come from inefficiency.

Here's a simple example. As a young procurement professional, I felt a great sense of accomplishment having successfully negotiated a rebate program with one of the suppliers I managed. Based on my calculations, IBM stood to take out about 12% of our annual cost based on the rebate. I watched our purchase volumes over time, and when we hit that rebate threshold, I called the supplier and requested payment. Little did I know it was going to take the better part of 6 months to actually agree on how much IBM had purchased during the period. My sense of accomplishment was shot.

As I recall that lesson learned, and I fantasize that I had had a blockchain solution in place at the time with my supplier, with my bank and their bank, I marvel at the thought of seeing the check show up in my account one day, with no further effort on my part. The blockchain smart contract could track our consumption, authorize the payment and execute the transaction. What a world it will be!

On a larger scale, blockchain holds the promise to drive unprecedented efficiency among supply chain ecosystem partners. Virtually any supply chain discipline or activity where disputes can arise is a candidate use case for blockchain.

While there is value in blockchain for basic end-to-end transaction process (such as order-to-cash, procure-to-pay), the technology has an equal and perhaps more innovative value in ancillary processes, such as asset lifecycle management, supplier performance management, engineering change management, supply chain risk management, and unsaleables management. The global blockchain technology market size is projected to grow to USD 1.6 billion by 2021, at a CAGR of over 55%. The supply chain slice of that is 22%, or USD 373 million. There is much opportunity [2].

With blockchain technology in place to support various supply chain processes, dispute resolution can be dramatically streamlined. Parties can focus on positive collaboration to quickly resolve disputes and improve overall supply chain performance – and avoid wasting time disputing the basic facts. Dispute resolution can also occur sooner, because the exception condition that give rise to disputes can be seen quickly by all parties who need to know.

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Every issue of *CSCMP Hot Topics* is initially released as a member-only benefit. Each edition may include early results from ongoing research being conducted for CSCMP or other organizations; new supply chain practices, thought-provoking ideas, or emerging trends; discussions of changes in the broader business and regulatory environment that may

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WHAT ARE THE CHALLENGES?

Blockchain solution development, deployment, and adoption can be challenging for several reasons; we're just getting started and the technology is evolving quickly. Many in the industry are asking, 'should I start now or wait for the technology to mature and stabilize?' Our position: Don't wait!

Assuming you're ready to move ahead, the first step will be to identify the right use case. Companies have to determine what their biggest pain points are, and where they have (or can build) the right ecosystem of partners to work with. At IBM, we like to say that blockchain is a 'team sport', and there needs to be a value proposition for each and every participant. If only one or two participants will benefit, it's not a good use case for blockchain. Our early conversations have revealed this short list of priority use cases:

1) Supply chain visibility – where's my stuff?

2) Product provenance – where was this item sourced, who had possession of it when, and am I sure it's safe/authentic/certified/etc.

3) Dispute resolution – who did what, when did they do it, did they meet their obligation?

With a great use case as your focus, you can now think through how to invest. It can be difficult to get the right set of partners to agree to initiate a blockchain solution and then to actually put it in production – especially as the team has to agree on issues such as standards, privacy, and revenue models. You may be able to develop blockchain application development expertise in your own organization's IT department, or you may choose to rely on vendors and consultants' solutions to determine how blockchain can provide the biggest "bang for your buck."

Because blockchain is a framework and does not define a particular data model, data standard or business application, solution developers will next have to determine what they want the blockchain to 'do' other than record events.

So as you can see, this is a journey. There are many questions to answer and agreements with ecosystem partners and solution providers to be had, but our position is that the potential benefits are worth every minute and dollar that will be invested. Design Thinking workshops and Proof of Concept projects are a great way to test the waters and start to answer all of these questions.

WHAT TO EXPECT IN THE NEAR TERM?

Aside from many workshops and PoCs, we have already seen a few very successful implementations of blockchain solutions for supply chain.

IBM Global Financing (IGF) is the world's largest technology financier. With more than 120,000 clients in over 60 countries, IGF was able to reduce time spent resolving financial disputes by 75% using blockchain technology [3]. Blockchain technology helps IBM Global Financing to quickly resolve financial disputes, providing comprehensive visibility across the entire transaction lifecycle and saving time and administrative costs.

"For me, the bottom line is that blockchain is coming, and it's powerful! But this is a journey, and we're in the early days."

The diamond industry is believed to incur $45B in losses due to diamond theft and counterfeiting annually. A company called Everledger has taken advantage of the lack of computerization in the industry, and delivered one of the first Hyperledger-based blockchain applications. The ledger tracks stones from the mine, through three stages of certification, all the way to the jewelry store, ensuring the provenance of each one through the use of digital images [4].

We also see large industry-specific endeavors underway that will be closely watched, such as the IBM and Maersk endeavor to manage transactions among networks of shippers, freight forwarders, ocean carriers, ports and customs authorities. The goal is to digitize and share required documentation and events on a blockchain to dramatically speed up import/export processes [5].

A second large scale project is underway to address food safety. Every year, around the globe, one-in-ten people fall ill - and 400,000 die - due to contaminated food. Dole, Driscoll's, Golden State Foods, Kroger, McCormick and Company, McLane Company, Nestlé, Tyson Foods, Unilever and Walmart have announced they will work with IBM to identify new areas where the global supply chain can benefit from blockchain [6].

For me, the bottom line is that blockchain is coming, and it's powerful! But this is a journey, and we're in the early days. There's a lot of creative discussion going on related to privacy concerns, 'micro-chains', and 'backchains' [7]. And let's be honest, there are still nay-sayers out there, as existing B2B networks and enterprise systems of record are the backbone of many industries [8]. I'm focusing on how to create a simple way for more of us to get started. I'm asking 'How do we leverage today's technology AND gain all the benefits of blockchain?' 'How do we get more solutions up and running faster, and give more companies a chance to participate…and contribute, to the evolution of the technology?' With any luck, I'll have an answer very soon. Stay tuned.

REFERENCES

[1] Gartner Hype Cycle for Emerging Technologies, 2017, 21 July 2017 ID: G00314560, Analyst: Mike J. Walker.

[2] http://www.businesswire.com/news/home/20170227005473/en/Global-Blockchain-Technology-Market-Showcase-CAGR-55/?feedref=JjAwJuNHiystnCoBq_hl-Q-tiwWZwkcswR1UZtV7eGe24xL9TZOyQUMS3J72mJlQ7fxFuNFTHSunhvli30RlBNXya2izy9YOgHlBiZQk2LOzmn6JePCpHPCiYGaEx4DL1Rq8pNwkf3AarimpDzQGuQ==

[3] https://www.forbes.com/sites/tomgroenfeldt/2016/11/03/ibm-trials-blockchain-for-supply-chain-dispute-resolution/#242650562496

[4] http://www.itcandor.com/blockchain/

[5] Maersk project https://www-03.ibm.com/press/us/en/pressrelease/51712.wss

[6] Food Safety Project https://www-03.ibm.com/press/us/en/pressrelease/53013.wss

[7] https://www.information-management.com/opinion/how-blockchains-can-revolutionize-the-supply-chain

[8] https://www.forbes.com/sites/stevebanker/2017/09/01/blockchain-in-the-supply-chain-too-much-hype/#1542bcf9198c

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