



# BLOCKCHAIN:

## WHAT IS IT AND ARE WE READY FOR IT?

*Experts separate fact from fiction and look at promising applications for the cold chain.*

**By Alexandra Walsh**

**T**he title of this article asks if the cold chain industry is ready for blockchain. Perhaps a presumptuous question considering most folks are probably not sure exactly what blockchain is...or isn't. And even if you do understand the technology, you still have to wade through the river of rumors swirling around how the technology may, or may not, be applied to the cold chain.

Let's start with what blockchain is.

### **What Is Blockchain?**

According to Marc Blubaugh of Benesch, Friedlander, Coplan & Aronoff, a law firm with many clients in warehousing and logistics, blockchain is a decentralized database or spreadsheet, often referred to as a digital ledger, that is maintained and updated by a network of participating computers.

"This highly secure technology permits parties to create a record, known as a block, that is time stamped and linked to the previous block so that it cannot be altered retroactively without the alteration of all subsequent blocks," explains Blubaugh. "The digital ledger is typically available to the public but can also be made private."

Blubaugh points out that while blockchain is the technology infrastructure for cryptocurrencies like bitcoin, just as the Internet has many uses beyond email, blockchain has many uses beyond cryptocurrencies.

### **The Potential of Blockchain**

Anna Johnson, Director of Corporate Development and Marketing for United States Cold Storage points out, "People are saying blockchain will be great for the supply chain, but how we translate what we currently know about blockchain into technology the supply chain can use, is a challenge. A whole lot of people are trying to figure that out, and there is a lot more speculation than research at the moment."

Johnson would know something about that – she's conducting qualitative case studies on the readiness of the cold chain industry for blockchain and other disruptive technologies for her dissertation for an executive doctorate in business.

"I hope my research proves that how we are dealing with the challenges of e-commerce and changes in the food retail market means we are figuring out omni-channel distribution, and that is the way we are evolving," Johnson says.

"I see the blockchain being used to facilitate the movement of goods internationally in the supply chain, but its applicability goes way beyond that," Johnson reasons. "I think its great value will be in provenance – in helping to ensure the quality, safety, and security of product in the cold chain and being able to consistently track the origin of product that consumers are eating, from farm to fork."

Melanie Nuce, Senior Vice President of Corporate Development for GS1 US, the global organization that develops and maintains global standards for business communication, the best known of which is the barcode, says from a purely technical capability, blockchain is people combining business applications with a ledger and its great value is that data can not be deleted or changed.

“What excites me most about blockchain is sharing data from one endpoint to another,” Nuce acknowledges. “Consumers, more than ever, are driving innovation and blockchain is going to increase consumer trust by providing the transparency they are asking for. If the consumer wants this information, let’s get ahead of data visibility and transparency and deliver to the consumer. As an industry, isn’t this what we’ve been pining for?”

Nuce adds that blockchain will impact regulatory auditing and trading partner efficiency and trust by adding automation and reducing human effort. “Blockchain is managing the supply chain on an exception basis, so everything else just follows without a hitch. Exception management is how the supply chain will evolve because to put it in cold chain shelf-life terms – you don’t want your product spending days on the road only to be rejected because you missed something in the data.”

In the supply chain and logistics industry, exception management is often defined as a process that is set up to capture information that sits outside the normal parameters of doing business – exceptions to the normal flow of the supply chain. Any interruption, issue or unexpected change can be flagged under exception management processes so that a manager can intervene, see what the issue is, and immediately correct it. The effectiveness of this process is entirely based on having connected systems and a real-time information flow in e-commerce and logistics operations.

“The potential of blockchain and smart contracts (see sidebar) to lessen human effort in the supply chain is a huge investment in time saving, and automating certain repetitive tasks is using computers for what they’re good at,” Nuce contends. “What they’re not good at is relationships. Unlike bitcoin, the supply chain will always be about relationships with partners – you’re not going to sell food to someone you don’t know.”

Blubaugh adds that in addition to track and trace and minimizing claims, proponents of blockchain identify other potential applications for the supply chain including foiling imposter carriers, accelerating load tenders, expediting payment, and leveling the playing field. “Many of these examples of potential applications illustrate how blockchain technology can benefit smaller logistics companies with limited resources by providing them faster payment, more expeditious claims handling, more and easier bid opportunities, and the like. By empowering smaller companies, blockchain promises to make the logistics market more competitive.”

## Smart Contracts

Blubaugh defines smart contracts as a series of business rules that two parties may agree to adopt that implement a series of if-then rules that will be performed, at least in part, by computers without the need for third-party intervention. He also notes that a smart contract does not perform its own reasoned analysis, unilaterally write or modify itself, or eliminate the possibility of disputes.

Blubaugh cautions that blockchain is not a solution to every problem and suggests that anyone considering using the technology should ask certain questions to see if it will be the right fit. “You want to ask yourself first, do I need to get numerous parties to work together, second, do those parties trust each other, and third, how important is it to have a tamper-proof record of transaction, and I think the latter is where the technology will be most important.”

### What It Isn’t

Nuce recalls that one of the first things she heard about blockchain was that it was going to replace electronic data exchange (EDI). “EDI in the supply chain is based around

information on orders, shipments, and payments. Blockchain is a distributed ledger that allows us to get very granular, tracing a package of strawberries from this packer to that store, but it can’t do it on the same scale as EDI.”

“However, companies that are using globally standardized business processes like EDI already have a head start in the blockchain game, since their internal systems can communicate data with their trading partners’ systems in a uniform way. This interoperability is going to be key for blockchain’s success in the future,” Nuce adds.

“Blockchain is not a panacea for all data and visibility that anyone can access anytime,” Johnson says. “And, it’s not for illegal black



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market transactions, it's not nefarious, it doesn't live on the dark web, and it's certainly not a technology that will fall by the wayside."

Johnson adds that another myth about blockchain is that there is only one. "In fact there are many blockchains – public ones, private ones, open-sourced and closed. It will not completely remove all human intervention, and it won't completely eliminate food fraud and recalls."

### Hurdles to Cross

Blubaugh notes that blockchain, like any other technology, has its fair share of challenges.

"At present, no uniform standards govern blockchain technology, which means it's going to be some time before most members will be able to adopt the technology in a meaningful way." But Blubaugh points out that the Blockchain in Transport Alliance (BiTA), formed by tech and transportation executives to create a forum for the development of blockchain standards and education for the freight industry, expects to develop broad standards for the transportation industry within the next 18 months.

### Mango Pilot Project

Since 2016, Wal-Mart has been working with IBM to develop software that uses blockchain to track products through its supply chain, from the farm to the consumer. In 2017, Wal-Mart traced a package of sliced mangoes back to their source. It took six days, 18 hours, and 26 minutes. After Wal-Mart used the blockchain software developed with IBM to track mangoes from a farm in Mexico to U.S. stores over a 30-day period, the same exercise took 2.2 seconds.

A second significant obstacle to adoption of blockchain, notes Blubaugh, is that even if a robust set of uniform standards is developed, the success of blockchain turns on how many parties adopt it. "Specifically, the utility of blockchain technology depends on maximizing the number of network participants. Therefore, the value proposition for early-stage users is not necessarily evident."

Johnson acknowledges that the cold chain industry is not super innovative and in terms of organizational readiness, is not yet ready for blockchain. "It is a chain, after all, and as

distributors, we are in the middle of the chain. So if we're not ready, we're the weakest link. We have to figure out our state of readiness and how to move it forward."

"This is my caution, and my enthusiasm: if we don't have good business processes in place – accuracy, completeness and consistency in our business and in the data we would trade with one another – it will just be more garbage in and more garbage out," Nuce warns. "That's what they've uncovered as blockchain applications have come to market."



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### It's Coming!

"I think if blockchain is adopted in our industry, we are only a year or two out," Johnson suggests. "With autonomous transportation, we're looking at maybe 10 years, but blockchain will be much faster because there's no need for infrastructure."

Nuce agrees. "I think we're looking at a year and a half to three years for blockchain to be fully, industry scalable, and then 10 years to full adoption. With any technology, it's a major uphill battle to adoption, but blockchain is inevitable. The cost of not investing could mean irrelevance."

Nuce adds, "Now is the time to educate yourself, know what's going on, and mentally prepare yourself for the possibility of blockchain. You can't afford not to." @

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The technology likely to have the greatest impact on the next few decades has arrived. And it's not social media. It's not big data. It's not robotics. It's not even AI. You'll be surprised to learn that it's the underlying technology of digital currencies like bitcoin. It's called the blockchain. Now, it's not the most sonorous word in the world, but I believe that this is now the next generation of the Internet, and that it holds vast promise for every business, every society and for all of you, individually."

—DON TAPSCOTT

*author and co-founder of the Blockchain Research Institute, a think tank conducting 70 projects about blockchain opportunities and challenges, speaking at the TEDSummit, June 2016.*



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