

# How Blockchain Is Improving The Global Supply Chain



Few, if any, industries in the modern marketplace are immune to the impact of technology.

The digital disruption touches all facets of the global business community, from product design and marketing to logistics and sales.

For procurement pros, one technology holds the potential to fundamentally alter the global supply chain forever: the blockchain.

The subject of endless speculation and analysis—and surrounded by a galaxy of buzzwords—the “blockchain supply chain” is one built on a high-tech foundation and a new approach to logistics, data management, and inventory control.

Understanding blockchain technology’s power, and the potential pitfalls it holds, is key to ensuring your organization’s supply chain management (SCM) is ready for the digital future.

## Understanding the Blockchain Supply

# Chain

Folks working in the procurement space already have a fairly well-developed understanding of existing supply chain management and the headaches it can create.

Supply chain management requires constant and detailed attention to the movement of goods and the exchange of currency as supplies become manufactured goods and are then distributed to the market via wholesalers and retailers.

It's a sometimes labyrinthine process, and a large organization can have multiple supply chains spread across countries, continents, or even around the globe.

This process of sourcing, creating, and eventually selling goods and services to your target market benefits immensely from transparency, accountability, and consistency, although traditional models sometimes fail to meet the mark when it comes to these traits.

Human error, delays, and decentralized data and documents can slow your workflow to a crawl—and maybe even bring it to a screeching halt.

## Enter The Blockchain

Bitcoin has been the largest driver of public awareness with regard to how companies and individuals use blockchain.

When implemented for cryptocurrency, it's an effective and secure method of cataloguing and protecting a given asset.

But the truth is, blockchain technology isn't limited to financial applications.

The blockchain is really *digital ledger technology*. Every interaction, every transaction, is recorded in the chain, with each block providing a snapshot of a specific moment in the lifecycle of the ledger.

Any changes are permanently recorded, and every piece of information is linked to those preceding and following it.

This is as true for material and shipping data as it is financial information.

Imagine connecting the raw materials of a given product to the finished goods produced and sold to consumers, with an accessible, transparent, and secure digital ledger recording all the data connected to that item.

With a blockchain solution, this kind of end-to-end tracking is not just possible, but applicable to *all* the goods and transactions in your company's supply chain.

As a result, blockchain technology is a true boon to supply chains, where it can greatly enhance not only data security and financial record keeping, but logistics, analytics, marketing, and more.

*Blockchain's most touted benefit is built on a simple idea: redundancy paired with interconnectivity. When every block is connected to every other, and no copy of the ledger can be modified without modifying the others, the result is an extremely secure paradigm for data storage and access with a built-in audit trail.*

## **Benefits of the Blockchain for Supply Chain Management**

Paired with complementary technologies such as machine learning and artificial intelligence (using, for example, a purchasing software suite), distributed ledger technology creates unprecedented opportunities within the global supply chain through:

### **Better Data Collection, Management, and Analytics**

The more data you have, and the more easily you can analyze and use it, the more effectively you can streamline your supply chain and exploit opportunities for savings, efficiency, and growth.

Combined with centralized data storage and shared access to key information for all shareholders, this allows you to move beyond strictly logistical, sales, or financial data and create more nuanced and effective reports and forecasts informed by all aspects of your procurement workflow.

Using private blockchain networks in tandem with public ones, companies can share essential information with customers, suppliers, and authorities while still protecting sensitive internal data for use only by approved parties.

## **Improved Logistics**

The blockchain makes it infinitely easier to connect critical information on purchase orders, receipts, shipping manifests, and other documents to the goods and services you've purchased.

It also provides:

- Permanent linking of physical assets, such as shipping containers, skids of material, and other items, to time, date, and location information.
- An easy way to use Radio Frequency Identification (RFID), QR codes, and traditional barcodes to identify and track goods for inventory management.
- Provenance and manufacturing information to confirm (for example) ethical sourcing, manufacture, and assembly, as well as certifications such as Fair Trade, Energy Star®, and American National Standards Institute (ANSI).
- An opportunity to move beyond Electronic Data Interchange (EDI)—a system of information exchange now entering its seventh decade—and allow for vastly simplified, more secure, and far more transparent trade finance record keeping. This shift will also slash total costs for record keeping and data exchange, which can run as high as \$7 per transaction depending on the EDI system used.

## **Greater Security, Scalability, and Supply Chain Efficiency**

Blockchain's most touted benefit is built on a simple idea: redundancy paired with interconnectivity.

When every block is connected to every other, and no copy of the ledger can be modified without modifying the others, the result is an extremely secure paradigm for data storage and access with a built-in audit trail.

The icing on the digital cake is the system's scalability; connections can be made with a theoretically infinite number of shareholders in real time, each with the appropriate level of access and approvals, stretched across as many nodes as are required—all without compromising the core security and transparency of the system.

This nigh-limitless potential has the somewhat ironic effect of simplifying the supply chain by removing overhead, reducing the need for extra staff and work hours, and centralizing essential data to be accessed, analyzed, and leveraged from across the globe.

The streamlining is further enhanced as data is used to remove kinks from transportation and manufacturing flows, evaluate and optimize supplier relationships (including the use of smart contracts that respond to performance benchmarks and supply demands), and identify new potential markets to pursue.

Smart contracts can also, through this same automation, set terms and conditions for invoicing, approval, and payment; if, for example, a shipment is billed but the goods aren't marked as received, the invoice doesn't match the purchase order, or the invoice is flagged as a duplicate, the system won't authorize the invoice for payment until verification occurs.

## **Potential Obstacles to Blockchain-Driven SCM**

As with any new technology, realizing the full potential of the blockchain in your supply chain network requires a willingness to move beyond the current system.

Change can be hard for most regular people, let alone massive megacorporations, and in order to take advantage of blockchain supply chains in global trade, companies need to overcome:

- **The Intrinsic Complexity of The Blockchain and Its Associated Learning Curve**

While the idea behind blockchain may be simple, effective implementation requires comprehensive training and support from blockchain pros in

order to bring your team up to speed. Beyond the technical and educational requirements for staff and suppliers, you may also need to invest resources in gaining buy-in from upper management, who may prove resistant to the change without adequate information and persuasion.

- **Lack of Organizational Engagement**

In order to be effective, blockchain solutions need complete and consistent engagement from all network participants. Everyone, from suppliers to staff, needs to follow established guidelines and conduct all transactions within the system to maximize its effectiveness (and avoid age-old problems such as invisible spend, logistics breakdowns, and invoice fraud).

- **The Need For New Regional and International Trade Law**

Implementation may only become more complex as the number of companies, organizations, and governments using the blockchain for supply chain management increases. On the positive side, once the dust settles and standards are set and enforced, this engagement will ultimately simplify the complex supply chain for all parties involved.

- **The Potential Bottlenecks Created by Lagging Tech**

With Bitcoin, Ethereum, and other cryptocurrencies, blocks have to be “mined” to complete validation of the data they contain. This process can sometimes take more than a minute (or several minutes) per block. This complex function is inherent to the blockchain process, but may need to be streamlined in order for widespread adoption in a marketplace that’s always looking for speed as well as security.

Companies like IBM and Walmart are already actively engaged in overcoming these roadblocks in their own supply chain networks.

The computer giant is building blockchain platforms to replace paper-driven

systems, make the Internet of Things part of daily life, and connect a wide array of industries via its HyperLedger initiative, while Walmart uses blockchain to track produce in pursuit of better food safety.

As early adopters with nearly unequaled reach, they have a unique opportunity to spread awareness and acceptance of blockchain solutions while also defining the standards that will be used in the future.

The faster companies can overcome these challenges, the greater the chance they'll have a say in tomorrow's blockchain-driven global supply chain.

## **The Building Blocks of Tomorrow's SCM**

From the local Walmart to the rapidly expanding markets of China, blockchain networks are revolutionizing supply chain management.

This emerging tech gives companies a chance to update and innovate simultaneously, and redesign their approach to not just procurement, but how they navigate and thrive within the datasphere.

Whether blockchain is the foundation of a new era of supply chain management or simply one step on the road to something even more powerful, it's clear that understanding and deploying this important technology is essential for any company looking to compete and thrive in a marketplace driven not just by dollars, but data.

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