

CSCMP hottopics

AUGUST | 2019

The Building Blocks of Blockchain

*By Kevin Otto, Senior
Director, Community
Engagement, GS1 US*

Key Standards for Blockchain
Success

2

Why This is Urgent

3



*Educating and Connecting the World's
Supply Chain Professionals.™*

It's a technology that has been heavily publicized and scrutinized over the past two years, diversely described as either the next big thing or a complex rabbit hole.

Depending on your point of view, and most importantly, depending on what problem you're looking to solve, blockchain is emerging as a potentially powerful tool. On the surface, the list of benefits sound promising and many of them could be truly revolutionary. Blockchain can:

- help the supply chain finally modernize and move away from paper systems.
- help companies better align with consumer demand for information transparency.
- lead to more accountability in the supply chain by creating an immutable ledger or audit trail of product events and transactions.

However, it's important to keep in mind that it is still a nascent technology with many unknown consequences and considerations attached to it. While some companies are pursuing blockchain quite confidently after use cases have been proven, many others are finding out that it's really not a magic problem solver. They have ended up learning more about their systems' ability to share data externally, their trading partners' data sharing capabilities, and have encountered serious data quality issues and inconsistencies.

The onus today is on industry to complete its due diligence in these areas before making serious commitments to blockchain technology and advocate for greater interoperability. With the global blockchain supply chain market expected to reach over \$9 billion by 2025, according to Allied Market Research (AMR), it's critical for supply chain teams to clearly define success now and determine if blockchain is the right path forward and the best use of their budget dollars.

One common thread between those who expand their blockchain implementations and those who pull back on blockchain is the essential foundation for data quality and systems interoperability enabled through GS1 Standards. As the most widely-used supply chain standards system in the world, GS1 Standards have been leveraged by industry for more than 45 years. Several GS1 Standards make up the building blocks of blockchain, as they provide consistency and structure to data transactions on a blockchain, increasing the likelihood that the intended outcome will be achieved.

As you evaluate blockchain, consider your organization's adherence to these key standards that are foundational to nearly every blockchain supply chain use case—including traceability, product provenance, preventing the circulation of counterfeit goods, and more.

The complex needs of different supply chains require the development of solutions that make sense for different use cases and industries.



*Educating and Connecting the World's
Supply Chain Professionals.™*

KEY STANDARDS FOR BLOCKCHAIN SUCCESS

Global Trade Item Numbers (GTINs) – These identification numbers are what power global commerce and help businesses manage products on the physical and digital shelf. If every item is uniquely identified with its own GTIN, it retains an identity regardless of where it is in the supply chain.

Identification that is persistent beyond the four walls of the company is key for a blockchain implementation. A blockchain is composed of “blocks” of data stored on a “chain,” i.e. a decentralized ledger. It creates an immutable record so the blocks need to contain a universal data language starting with product identification to ensure that the right data is stored and communicated further down the chain.

Global Location Numbers (GLN) – Similar to GTINs, these are numbers that uniquely identify organizations and locations in the supply chain. GLNs give companies the flexibility to identify any type or level of location required for supply chain visibility. They can identify a warehouse, a restaurant, a retailer, a hospital, even something as specific as a store shelf. Or, they can identify a company’s legal or functional entities as they relate to a particular business transaction, for example as buyer, seller, or carrier.

Why is this important for blockchain? The most popular use cases in blockchain today revolve around supply chain visibility with specific focus on locations and origins. For example, a food recall use case requires location accuracy, as we saw with Walmart’s early mango blockchain pilot where the retailer’s supply chain team was challenged to trace mangos from a supplier in Mexico to a US store. It’s equally necessary to reveal a product’s specific origin, as in Cargill’s turkey tracing app, where consumers could find out the exact farm where their Thanksgiving turkey was raised.

GSI barcodes – For data to be shared among trading partners (with or without a blockchain), it must be captured. It’s a given that most companies use the U.P.C. seen at checkout. But for supply chain visibility purposes, more trading partners, particularly in the food industry, are leveraging the GSI-128 barcode, to capture dynamic product information and serialized logistics data, such as expiration date, and batch/lot numbers. Using these barcode labels, companies enable the automatic recording of product-specific information whenever a barcode is scanned, for a more real-time view of where products have been and where they are going.

Electronic Product Code Information Services (EPCIS) - One particular standard has been cited by those piloting blockchain programs as essential to maintaining the proper flow of data. EPCIS is a GSI Standard that supports the exchange of physical event data and is increasingly deployed in sectors such as fresh foods, healthcare, and logistics to improve efficiency in areas ranging from inventory management to consumer and patient safety. It has been used to enable significant improvements in transactional data sharing.

At its core, EPCIS is like a standardized application program interface (API). Typically, an API is used to specify how software components should interact. EPCIS acts in a similar way to capture and share information about the movement and status – the what, where, when and why – of products, logistics units and other assets in the supply chain. EPCIS simplifies the capture and description of events that are written and companies can more instantly rely on a single version of the truth about supply chain and logistics events. Also, it can be implemented with a number of different data carriers, including GSI barcodes and EPC-enabled

radio frequency identification (RFID). Unlike “batch oriented” data transmission mechanisms, EPCIS is more suitable for blockchain because it more efficiently documents the potentially massive amounts of event-based data.

Blockchain and GS1 Standards—How Do They Work Together?

+ To Facilitate Business Applications

What problem are we trying to solve?

- ✓ Track & trace, anti-counterfeit
- ✓ Order-to-cash processes
- ✓ Electronic commerce



+ GS1 Standards Can Enable Data Sharing Between Parties

What are GS1 Standards?

GS1 Standards are foundational data standards that provide unique identification of products, locations, and assets along with standardized data sharing formats.

This interoperable global language of business can be used to exchange information about the “what, when, where, and why” of events occurring in the supply chain.



Identify



Capture



Share

- ✓ Standardized identifiers

- ✓ Transaction data

- ✓ Visibility event data

- ✓ Master data

+ Through Different Platforms, Including Blockchains

What is blockchain?

Blockchains are shared databases (or indexes) of information about transactions and events.

Storing traceability or event data about your products or other assets in a shared database is not a new concept. In fact, entire industries have been sharing such data with each other for years with GS1 Standards.



Do GS1 Standards Support Blockchain Ecosystems?

Technology providers are launching blockchain applications at a rapid pace, creating various enterprise ecosystems for the supply chain community to choose from. Eventually, these ecosystems will need to communicate using consistent data formats. You can only expect interoperability across ecosystems when you have a common foundation for data. The most widely used supply chain standards in the world—GS1 Standards—can serve as this foundation, built on:

- Globally unique, persistent identification for organizations, locations, and things
- Standardized language (data format and vocabulary) for supply chain events
- Scalable network governance model that crosses ecosystems

As your teams evaluate blockchain, and especially if you’re looking to explore nontraditional applications in the field of transparency or traceability, be sure to have your technical teams or your solution providers reach out to GS1 US* to learn more about leveraging the power of global standard data structures and identification.



WHY THIS IS URGENT

We are at a critical moment in blockchain scalability where companies are still determining which aspects of blockchain work for an enterprise supply chain setting. The automation advances brought by smart contracts alone are valuable for some, while others may find more inherent value in the entire blockchain ecosystem. The complex needs of different supply chains require the development of solutions that make sense for different use cases and industries. As those solutions are developed, it’s important to prepare data and organizational teams now. Simply rushing into blockchain without first adapting legacy systems and processes for less manual involvement will not yield a successful outcome.



Educating and Connecting the World's Supply Chain Professionals.™

About CSCMP Hot Topics

Issues of *CSCMP Hot Topics* 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 impact the supply chain and logistics field.

Recent studies confirm this. A survey from the World Economic Forum and Accenture found that while respondents expected a 24% return on investment (ROI) on their early blockchain projects, they only saw a 10% return on average. Industry stakeholders interested in blockchain should learn from this early stage and prepare accordingly to maximize ROI.

Ultimately, no matter what happens with blockchain, its presence is forcing an important conversation around the long overdue modernization of the supply chain. By bringing more trading partners together, blockchain has reignited interest in data sharing and interoperability that can eventually reduce friction in the supply chain and create the agility needed to align with consumer needs. Now is the time to stay educated on blockchain and continue to evaluate its value to overall supply chain goals. More information is available at www.gs1us.org/blockchain.



*Educating and Connecting the World's
Supply Chain Professionals.™*