

Hyped Up?

See definition of blockchain on page 24.

BLOCKCHAIN, THE FRESH FOOD SUPPLY CHAIN AND WHY A HYBRID MODEL IS BEST



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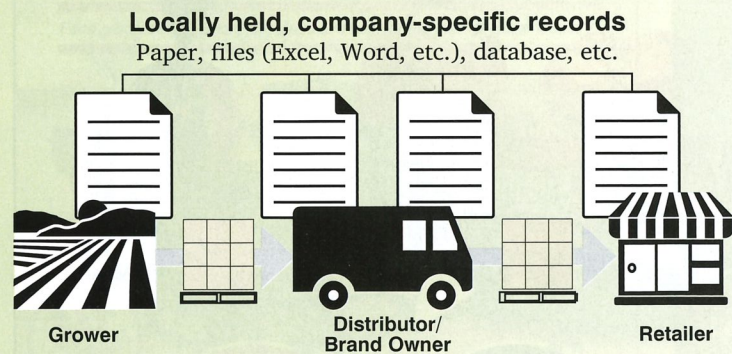
IT'S IMPOSSIBLE TO KNOW whether a Super Bowl will live up to pregame hype, like the Eagle's 8-point victory just did. The same is true with explosive trends like blockchain. You can't go a day without a story about blockchain in the trade and business press. Some companies have even changed their

name to include the word "blockchain," without even having the technology to back it up. Despite all the hype, blockchain merits a discussion and serious consideration as the upside benefits for its use and application in the fresh food supply chain are significant. But, at this point, is blockchain a technology looking for a problem to solve, or a way of solving or improving the solution of a known problem? And, how does implementing blockchain

relate to your existing business processes? Can or should blockchain replace your current systems or is a hybrid model the best? It's prudent to find ways to apply blockchain to address known business issues, as this will significantly improve its chances of being successful. And there are many solid use cases that exist in the food supply chain today. Food safety and traceability are often cited as a place to start but ensuring food freshness can also

How does blockchain affect traceability?

Blockchain could affect how the industry approaches traceability. That is because the technology allows more people access to the records about how and when food was packed and shipped.

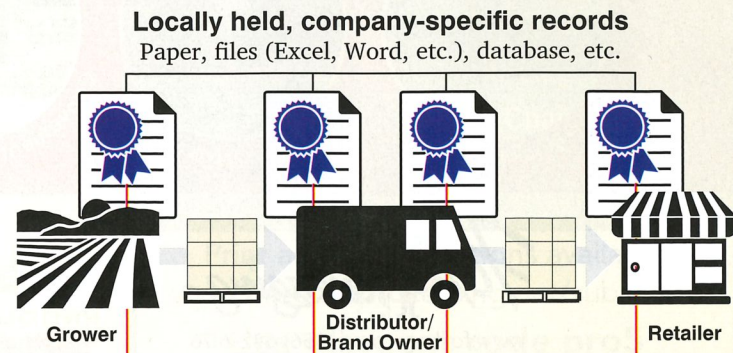


The 1 Up/1 Back model of traceability

FSMA specifically does not say what technology to use and only mandates 1-up/1-back traceability. When contamination events occur, this leaves government agencies with the work of contacting each party in the chain to request their 1-up or 1-back trace information, in order to stitch together an end-to-end picture. Companies have 24 hours to respond to such requests.

1 Up/1 Back using industry standard records

The FSMA pilot report encourages the use of industry standards, which makes it easier to correlate the various records received from the different parties in the end-to-end chain. The standards focus on the item, quantity, lot/batch/serial #, harvest date (lot and harvest are optional). This data is put on a standardized label on each item, case, and/or pallet.



Industry standard label applied to each case by grower. Data format product, qty, lot # (read from labels) recorded at each step in the chain

benefit from the intelligent use of blockchain technology.

Zest Labs commissioned an article by ChainLink Research about how blockchain can be applied to the produce industry. While it discusses how food traceability and freshness can be managed by a networked SaaS (software as a service) solution without the need for blockchain, the author, Bill McBeath, states that "recording the various transactions, HACCP (hazard analysis and critical control points) steps and temperature readings onto a blockchain can add trust and additional capabilities to the system."

In addition to discussing applications of blockchain solutions, the article identifies several key things to consider before you begin on your blockchain-enabled journey:

- It's essential to put the right data into the blockchain to achieve true transparency, as one of the main benefits of blockchain is enabling all relevant parties to have access to the data. There's immense value in collecting quality-focused data on its own, but analyzing, applying

and making traceability, food safety and food quality data broadly available is where the benefits really start to multiply.

- It's important to have a blockchain agnostic architecture. There are many different blockchains today and no industry standard and, as with the Super Bowl, it's too soon to find out who the winners and losers will be. Betting exclusively on one may prevent you from working with companies in your supply chain that use another.
- Understand the role of public versus permissioned blockchains. For supply chain use cases, a permissioned blockchain may make more sense.
- Know the difference between blockchain-enabled Smart Contracts and off-chain automation in your existing business applications. While utilizing smart contracts in a blockchain may be feasible, it may not be the most cost-effective approach to solving your business needs.

This leads to the question of whether or not you should abandon your existing SaaS-based approach in favor of a

blockchain approach. The answer is no. Each brings advantages to the game. McBeath said that, ultimately, hybrid systems combining SaaS and blockchain models will prevail.

"Blockchain technology alone cannot provide freshness, safety, provenance and recall capabilities. That requires data and capabilities from outside the blockchain," he said.

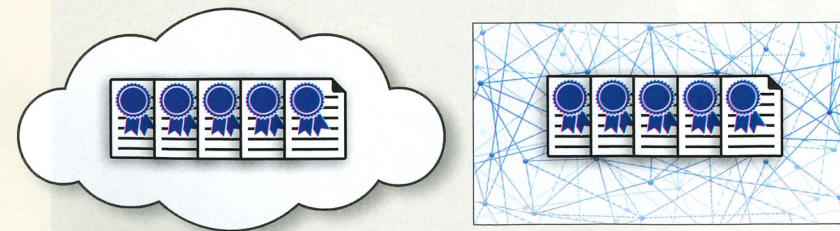
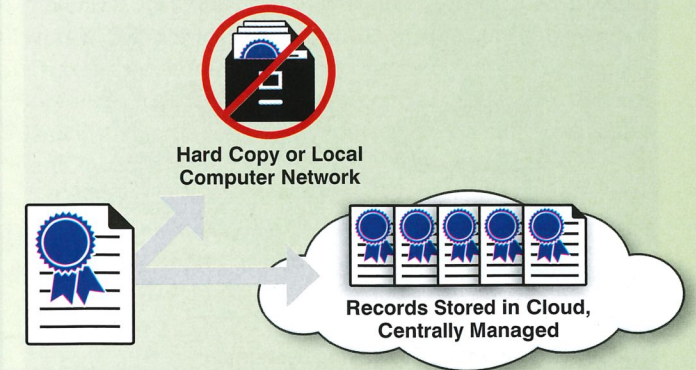
The best emerging approach, McBeath said, seems to be a hybrid consisting of:

- A centralized networked SaaS platform providing economical scalability, and deep algorithmic and process capabilities.
- Combined blockchain and smart contracts for transparency and validation. Blockchains are attractive because of their ability to create a shared, single version of the truth between trading partners. However, a networked SaaS platform can provide a shared, trusted single version of the truth at a much lower cost.

If you'd like a copy of the Chainlink Research article, please email me at kpayne@zestlabs.com. P

Cloud-based record keeping

While not mandated by regulations, a networked cloud-based (aka SaaS) system provides a far better solution than 1-up/1-back. First, it is important to distinguish between Enterprise SaaS vs. Networked SaaS architectures. Both have a shared code model (run in a single multi-tenant instance), but the enterprise SaaS model lacks a shared data model. In a networked SaaS system, the chain-of-custody data (hand-offs of batches or individual items from one party to the next) are recorded in a shared networked database, instantly accessible to authorized parties. This makes the trace-back and trace-forward processes virtually instantaneous.



Blockchain-accessible records

In the cloud-based approach, a single central authority controls the system. The nodes may be physically distributed but control is centralized. In contrast, control of the blockchain nodes is decentralized, allowing many parties to participate in ongoing verification and validation of the data. The blockchain architecture makes it much harder for someone to change data after the fact.

▲ Information and text from Chainlink Research