

Blockchain in Consumer Goods: The Impact, the Challenges, and the Way Forward

by David Laborde

Blockchain, Bitcoin, Ethereum... these words that were once only used in technical circles have now become mainstream vernacular. Since Bitcoin traded at an all-time high of over \$17,000 per coin in December 2017, blockchain technology has been all the buzz from trading companies to food and beverage manufactures. But how can this new technology really impact your business and how can you get started?

The Blockchain Potential

Blockchain could also improve supply chains by identifying where inefficiencies occur. Cash flow could increase by improving account receivables through smart contracts, by verifying transactions the moment they occur, and by executing payment immediately and electronically. The proposed benefits of blockchain technology are huge. The distributed ledger technology can be leveraged to increase trust within the supply chain, ensuring products are what they say they are. Using the chain, a company or consumer can trace a product in their hand all the way back to its source, by simply scanning a QR code or looking up a unique identifier online. In the event of a recall, blockchain technology can help identify affected products within seconds, saving companies millions of dollars while protecting consumer health and brand trust.

With all of these upsides, it is no wonder big names within the consumer goods industry have started to experiment with various blockchain technologies. Carrefour, one of the largest hypermarket retailer chains in the world with a market cap of over €70B, began experimenting with blockchain technology last year. Carrefour started small, partnering with IBM's Food Trust blockchain to trace their free-range poultry line¹. Following that success, Carrefour has expanded the technology to select dairy and produce lines. They have also partnered with Nestle, another IBM Food Trust customer, to enable blockchain traceability for Nestle's Mousline potato products².

Three Blockchain Challenges

Innovative technology has always been sexy. Each new idea or advancement brings the science fiction we all imagined as children closer to reality. And the decision makers in boardrooms want to be a part of bringing that future to life.

We talk with C-Suite executives every day, and these conversations are happening more and more. In each of those discussions, what we hear boils down to: "What about blockchain? I've read about it and think this could transform how we do business, but where do we begin?"

First, let's discuss the current challenges blockchains face.

No Industry Standards

Each blockchain is independent and there is yet to be a consensus around how and what data should be captured. With no industry standards in place, chains cannot easily communicate with each other. If a grocery retailer is trying to use Nestle products on IBM's blockchain and Bumblebee Tuna's products on SAP's blockchain, that information cannot easily be integrated. Each may have different data types and formats and may even capture different information. The retailer will then need to create a translation key so it can absorb and translate each chain's information into their system.

However, chains are beginning to address this issue. Source Chain International from Australia and Hoan Vu from Vietnam, both food testing labs, are partnering to create a database using OriginTrail's blockchain and GS1 standards³. By using GS1 standards, which are common in

What is Blockchain?

A blockchain is a continuously growing list of records, called blocks, which are linked and secured using cryptography. Across the chain are nodes, which record a transaction. For a block of new information to be added to the chain it must be validated and confirmed by a consensus of nodes on the network.

For more background, read [Three Ways Blockchain Technology Will Impact R&D Management](#) (link in More Reading section below).

the global food and beverage manufacturing industry, both companies collect the same data information. Now if a customer uses either lab, the blockchain data collected will be consistent and easier to integrate to their system.

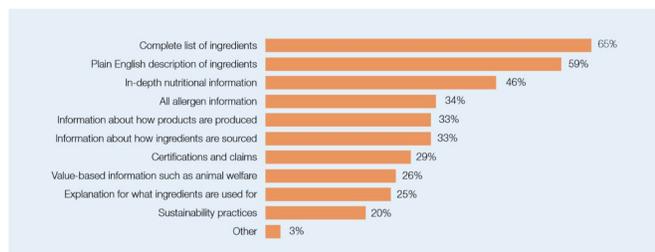
In a recent report from GS1, Bridging Blockchains: Interoperability is essential to the future of data sharing⁴, the authors request a call to action for leaders in industry to come together and create a standard, enhancing the sharing and flow of data as blockchain technology continues to develop.

Debating Public vs Private

The next challenge facing companies using blockchain technology is to determine if their chain should be public or private. Since the blockchain is a distributed ledger where each node is validated by its members, all information can be seen by those members. Therefore, if a chain is public, all information can be seen, and so can all the transactions. For larger corporations, the information shared – trading partners, goods, location or even frequency – could expose strategic advantages they do not want to share with the world or their competitors.

On the flip side, consumers increasingly want to know more about the products they purchase. In a new report from the Food Marketing Institute, 75% of shoppers are more likely to switch to a brand with more information on a label, up from 39% in 2016⁵. This means companies need to decide the balance between what blockchain information they decide to share with the public versus which business transactions to keep private.

How Shoppers Determine Transparency



Source: Food Marketing Institute, Label Insight

But what if a company wants both – public transparency while maintaining data privacy? Enter Hybrid Blockchain⁶. A hybrid blockchain consists of using both a public blockchain and a private network that restricts participation to only those invited. Leveraging this technology, companies have the flexibility to determine what data is shared and with whom. Governments and multinational organizations are gravitating towards hybrid blockchains to gain the benefits of distributed ledger technology without the associated risks.

Cost (and Who Pays for It)

Implementing a new technology brings added costs. And a large decision companies will need to make is who will pay for that added cost? To implement blockchain, each transaction's data must be exchanged and validated. Often, that exchange occurs instantly by using sensors. The sensors can range from RFID chips the size of a grain of sand inserted into expensive wine bottles, to chips placed on product labels or attached to cases of goods. In every situation, some sort of technology will need to be installed so that when a transaction occurs, that data can be read, transmitted, logged and verified by the blockchain. And each transaction along the chain – from the farmer to the consumer – will need to be recorded.

So, who will pay for this? For vertically integrated companies, it is a simpler decision. For companies that interact with many partners, the question becomes more complicated. Should the farmer pay for the sensor to be added to his farm? Or the processing manufacturer? Will the shipping company incur the cost of adding sensors to their containers? And if the company pays for the sensors, will they also pay for the software, installation and maintenance?

When new technologies enter the marketplace, governments often step in to aid in user adoption. In 2018, the UK's Government Food Standard Agency (FSA), successfully completed a food chain blockchain trial for beef in a cattle slaughterhouse⁷. While the trial was limited and initial data collected small, government programs like this are a strong start in spreading the costs across all participants in a food chain, as well as potentially subsidizing implementation costs.

Getting Started with Blockchain

So, with such clearly defined benefits as well as significant obstacles, what should a company executive consider when exploring blockchain?

First, **gather a deeper understanding of your supply chain**. In order to successfully implement a blockchain, you need to fully understand your entire supply chain, who the players are and what information is or can be shared between each transaction. By fully mapping out your entire supply chain in detail, you will fully understand how your products move from farmer to consumer and what data can and should be collected at each transaction.

After you understand all the players throughout your supply chain and each of their respective transactions, **start initiating conversations**. Who are your most trusted partners? Are they exploring blockchain as well? Could you both test a common product to share costs and knowledge, building a chain together? Or perhaps, could you start in another aspect of your business – like marketing or finance? By testing in other departments, you can experiment with blockchain, understand the limitations and benefits, and expose any technology weaknesses before investing in a larger chain.

And if you're comfortable with it, begin having a discussion with other leaders in your industry. Can you begin to develop a common blockchain language, or set the standards for what kinds and types of data to collect, increasing blockchain use and adoption? As noted in the March 2004 HBR article, *The New Rules for Bringing Innovations to Market*, by Bhaskar Chakravorti⁸, "when a new product's adoption by one player depends on its adoption by other participants, there has to be a systemwide switching of behaviors before change can take place."

After mapping your supply chain data and assessing blockchain throughout your industry, you can **begin evaluating your blockchain ROI**. Start by answering these questions: What is my company's cost versus benefit? Who will pay for the nodes and what is their incentive? What drives my company's need for blockchain and what is the expected benefit? Are my customers requesting more transparency in my product's supply chain? In the event of a product recall, is my exposure dependent upon my identification and response time? And most importantly, do the results of implementing blockchain align with my company's core values, culture, and strategic goals?

Finally, **stop waiting and start experimenting**. Companies are testing blockchain in all aspects of their business; not just in supply chain, but marketing and finance too. And many are experimenting with new and innovative technologies. A common trend is to run think tanks, competitions or idea accelerators that are targeted specifically at identifying and developing ideas and emerging technologies. These new technologies, like blockchain, often turn into commercial pilots, advancing both the company and the industry to the leading edge.

Carrefour's Blockchain Success

If we return to our Carrefour example as one of the emerging leaders in blockchain use, we can see how they followed these same steps. Carrefour began testing blockchain with small product lines that the company vertically controlled; poultry and dairy. The company fully understood the entire supply chain for these products and was able to control both the implementation costs and the data that was shared with the end consumer.

After testing on smaller product lines, Carrefour expanded their blockchain reach by initiating conversations and partnering with others in their industry. They've since partnered with IBM and Nestle to add additional products to their blockchain. And while exploring blockchain, Carrefour has started experimenting with new technologies that could impact their business. In June 2018, they announced a partnership with Google⁹ in which both will collaborate in developing new shopping experiences for each other's customers.

The Bottom Line on Blockchain

It's early, and blockchain is still in its infancy. But it does hold great potential for the food and beverage industry. In April 2018, the U.S. Food and Drug Administration, along with the Centers for Disease Control and Prevention (CDC) and state and local partners, investigated a multistate outbreak of E. coli O157:H7 illnesses linked to romaine lettuce from the Yuma growing region. Click for more.

With companies deploying pilots and some even scaling their efforts to full production, blockchain is still a long way from becoming a household name. To overcome, you need to be proactive in controlling your company data, discussing blockchain opportunities and standards with other industry players, and embracing additional new technologies.

Blockchain is still in its infancy, but it's on the forefront, reaping the benefits as the future unfolds.

When it comes to **initiating conversations**, take the example of the widespread adoption of Adobe Acrobat as a new technology. Adobe successfully tackled the large task of changing consumer behavior while increasing use of their software. By understanding and leveraging Metcalfe's Law, a network's value equals the square of the number of users, Adobe launched Acrobat by aligning with power players in the industry, like Microsoft, AOL, and Google, and complimenting their services. Adobe then created incentives for all involved parties, like free downloads and open source code, increasing user adoption. These strategic moves changed consumer behavior and increased adoption, launching Acrobat as the preferred PDF reader across the globe.

More Reading:

[Three Ways Blockchain Technology Will Impact R&D Management](#)

[In Today's Digital Era, Do We Still Need PLM?](#)

References:

1. Carrefour Hatches Poultry Tracking Blockchain Program: <https://www.thomasnet.com/insights/carrefour-hatches-poultry-tracking-blockchain-program/>
2. Carrefour - Nestle Blockchain: Technology for food transparency with Mousline!: <http://www.carrefour.com/current-news/carrefour-nestle-blockchain-technology-for-food-transparency-with-mousline>
3. Blockchain Technology to extend GS1 standards to food testing labs "for first time": <https://www.foodnavigator-asia.com/Article/2018/03/12/Blockchain-technology-to-extend-GS1-standards-to-food-testing-labs-for-first-time>
4. Bridging Blockchains: Interoperability is essential to the future of data sharing: https://www.gs1.org/sites/default/files/bridging_blockchains_-_interoperability_is_essential_to_the_future_of_da.pdf
5. Quantifying the value of transparency: <https://www.foodbusinessnews.net/articles/12532-quantifying-the-value-of-transparency>
6. Hybrid Blockchains: The best of both public and private: <https://bravenewcoin.com/insights/hybrid-blockchains-the-best-of-both-public-and-private>
7. UK Government Food Agency Trials Food Chain Blockchain, Beginning with Beef: <https://bctechreport.com/uk-government-food-agency-trials-food-chain-blockchain-beginning-with-beef/>
8. The New Rules for Bringing Innovations to Market: <https://hbr.org/2004/03/the-new-rules-for-bringing-innovations-to-market>
9. Carrefour and Google Sign Strategic Partnership: <http://www.carrefour.com/current-news/carrefour-and-google-sign-strategic-partnership>

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About the Author



David Laborde

david.laborde@kalypso.com

David is a senior consultant at Klaypso. A PLM specialist in the CPG industry, his focus is on process improvement, supply chain, and product development.