



WHITE PAPER



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Blockchain and Achieving True Transparency

Proactively Managing Food Safety and Freshness
with Blockchain and IoT Technologies

Introduction

Many industry experts are extolling the virtues of blockchain technology. Some paint it as a panacea for addressing every aspect of supply chain management. When it comes to helping to ensure food safety in the cold supply chain, blockchain certainly can be used as a critical component to prevent mistakes in the handling or distribution of food, especially those that result in recalls or foodborne illness outbreaks. To do this successfully, the solution needs to have reliable data about a product's condition and processing compliance as it moves through the supply chain. When the right data and blockchain are coupled together, we can go beyond after-the-fact forensic analysis to proactive management of the cold chain, anticipating and reacting to issues before they become costly problems.

Changing Consumer Expectations Change the Supply Chain

Being proactive in managing food safety issues has grown in importance. Today's on-demand culture has driven consumer expectations such that produce is expected to be available in all varieties, all year round. This means that supply chains, once mostly local, are now greatly extended with product coming from other states or even other continents, spanning thousands of miles and taking many days just to reach the store shelf. And it's not just distance, there are many more 'hands' touching and processing product as it makes its way through the chain, and complexity always adds challenges.

This new reality makes transparency increasingly difficult but significantly more important. Today's expanded ecosystem has multiple manufacturing and shipping partners in between farm to fork. And, the more food changes hands, the more chance there is for mishandling, temperature discrepancies and other quality issues that can increase the risk of foodborne illness outbreaks and major food recalls.

For this reason, growers, manufacturers, logistics providers and retailers need "True Transparency" throughout the entire fresh food supply chain. This means everyone can have access to every link in the chain and everyone involved, including consumers, could have complete visibility into where food has been and if it has been handled and distributed correctly.

What is Blockchain?

Blockchain takes the concept of a transaction ledger and brings it into the digital age through a continuous list of records (otherwise known as blocks) linked together and secured using cryptography. From a food quality and safety perspective, blockchain enables a trusted, secure distributed network that makes it easier to track a product's journey through the supply chain and log data points about key safety and quality information at every stage.

Achieving True Transparency with Blockchain and IoT

Thanks to technology advances, it's now possible to proactively manage food safety and quality issues, and it's easier to achieve than most would think. And the most important factor to achieving True Transparency is to manage the product itself and not just the various components of the supply chain.

The first step in achieving this is monitoring the product by the pallet, such as pallets of strawberries or lettuce, because critical variations occur at the pallet level versus the

temperature of the pre-cooler or trailer. For instance, focusing on trailer temperature provides minimal value as it's been demonstrated that temperature of the trailer and pallets within it can vary widely.

Zest Fresh™ starts with the product in the field right at harvest. It then tracks the product constantly throughout the supply chain, monitoring and reporting in real-time for temperature excursions or improper processing. Did the product sit out in the sun for multiple hours at the pack house? This can increase the chances of pathogen growth. For cut or bagged product such as lettuce, was it washed, tested, and did it pass HACCP regulations? Equally important is knowing the logistics as product moves from harvest to processing, and distribution all the way through to the retailer. Zest Fresh IoT sensors autonomously collect data along every step of the supply chain.



Blockchain can help with tracking HACCP compliance and logistics as products move through the supply chain

The next step to achieve True Transparency is enabling suppliers and retailers alike to leverage the data collected. There's immense value in collecting quality-focused data on its own, but analyzing, applying and making it broadly available is where the benefits really start to multiply. As an enabling technology, blockchain is rapidly emerging as a powerful utility to transparently and securely distribute IoT data across the supply chain.

Zest Fresh and Blockchain Support

The evolution of blockchain as a protocol for business-to-business, and even business-to-consumer, transactions brings new options for growers, distributors and retailers to proactively participate within the broader supply chain. In addition to support for the digital ledger and assets, blockchain smart contract support allows key operations to be automated that reduces both cost and risk in addressing tracking, quality and food safety issues.

In the case of foodborne illnesses or recalls, blockchain data can be used in real-time to proactively identify, track and manage removal of products at elevated risk of contamination. Because there is one shared view of the product in blockchain, everybody sees problems as they are known. Manufacturers and retailers have the potential to eliminate products at risk before they reach the consumer, minimizing or eliminating recall challenges, especially related to consumer safety, brand reputation and customer loyalty.

True Transparency is the foundation to building a trusted system that allows all the participants to work together, transforming the food supply chain while meeting increasingly high consumer demands and expectations. Zest Fresh delivers the right mix of IoT and blockchain providing a singular view of farm-to-fork for both manufacturers, retailers, and even consumers.

Zest Labs announced support for blockchain in the Zest Fresh Platform, at no additional cost for growers and shippers. The addition of blockchain enables a trusted, secure distributed network for all supply chain parties creating True Transparency for food freshness, safety and sourcing records. Zest Fresh manages the conversion of contracts to blockchain networks

and translates purchase orders into blockchain transactions, keeping confidential information private to permissioned parties only.

Using secure, authenticated autonomous sensors and intelligent access points to the secure Zest Cloud, the Zest Fresh solution quickly delivers access to blockchain technology for its customers and the overall food supply chain. By combining Zest Fresh predictive analytics, the solution can extend the value and power of smart contracts that can self-execute and recognize compliant or non-compliant product based on agreed upon specification.

Zest Fresh is the only freshness management solution that autonomously tracks and reports in real-time the freshness of products from harvest to the retail store or restaurant kitchen. With the industry's first dynamic freshness metric – the ZIPR Code™ (**Z**est **I**ntelligent **P**allet **R**outing Code) – Zest Fresh provides continuous real-time visibility of the remaining freshness capacity of produce and then directs intelligent routing to optimize delivery for required shelf-life as well as data about the handoffs throughout the supply chain.

This unique combination of secure traceability and the Zest Fresh ZIPR Code freshness metric provides True Transparency and intelligent routing that significantly improves freshness consistency for consumers and reduces waste for retailers, while also improving supply chain management to proactively manage food safety.

For more information on Zest Fresh and how it can improve your business please contact us at:

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