Embracing digital food transparency in the food sector: the time is now

Incoming regulations and standards are making the case plain: food manufacturers need to prepare for a digital food supply chain. Why not start now?

by Ian Scott-Mance, Technology Manager, Mettler-Toledo ProdX. www.mt.com/prodx-pr

The early adopters are already out there. The arguments have been made and accepted, and those who codify regulations and standards are signalling their intent strongly: the food manufacturing industry must apply a digital transformation to the way it manages food safety and supply chain transparency.

There are benefits to be had for all through a realisation of this transformation, yet right now, most food manufacturers are hesitant. In their hearts, they know that a move from manual track and trace to digital is coming.

In their heads, there is a growing realisation that it could be good for their business. In fact, with legislators and retailers starting to insist on digital transparency in the food supply chain, it is not an exaggeration to say it will be critical to the continued existence of every food manufacturer. Many have nagging worries about cost and complexity. Many are watching and waiting, assessing the technological trends, biding their time for the right wave to surf on. But there is no need for this to be either complex or expensive – the technology already exists.

Data collection

Food manufacturers must start preparing for digital transformation by looking inward – at their own systems and processes, and the data they can already harvest from them. The first step is efficient data collection – then this data must be shared throughout the supply chain, however the latter cannot happen if the data does not exist in an accessible form. Even the smallest farmer can participate, by accurately weighing each batch of potatoes on industrial scales before a lorry takes them away. Keeping that data (the weight and logistics information) in a database puts the farmer in a position to contribute to the digital transformation of the food supply chain. It also potentially allows the end customer to see the origin and, if the data is captured, the field from which they were harvested.

Early adopters

This concept of information sharing is critical to digital track and trace, enabling the identification of the whereabouts of specific batches of food at any given time in the past or present, in a matter of seconds.

Digital food chain transparency has already been proven by early adopters to benefit food manufacturers in many different ways.bOne such example is the US company Golden State Foods (GSF), which has a manufacturing facility in Alabama producing over 160 million pounds of beef products per year. It supplies fresh beef patties to a network of quick service restaurants.

The company has partnered with IBM to create a digital supply chain system based on blockchain technology, Radio Frequency Identification (RFID) and the Internet of Things (IoT), that it says makes its customers more confident in the food they eat.

The project is the subject of a YouTube video, during which Guilda Javaheri, GSF's Chief Technology Officer, explains that "it is not just about digitising your supply chain; it is about reducing the hours of reconciliations that companies go through. It also optimises the inventory throughout the supply chain. You are going to be able ultimately to have the right product at the right time and the right place. Can you imagine how much wastage today can be prevented with that kind of information?

"That is what makes this pilot unique – because manufacturers, distributors and customers are really sharing the data, and that is really the common goal that everyone is striving towards."

On another level is IBM's partnership with the retail giant Walmart, which has seen the creation of a food traceability system, again based on blockchain technology.

Data collection is now mandatory for all suppliers of fruit and vegetables to the retailer. In a proof-of-concept project, involving mangos sold in Walmart's US stores, the time it took to trace the origin of the produce was reduced from around seven days to 2.2 seconds.

Importantly, the participation of suppliers in this project has not been an onerous one. To benefit from the system, suppliers do not have to be blockchain experts by any means; they just have to know how to upload data to the blockchain application.

Blockchain explained

It is worth explaining a little about this technology, which has been the bedrock of digital food safety projects thus far. Blockchain is a chain of linked blocks of data records, each bearing a cryptographic hash of the previous block.

Once data is recorded in a block, this then becomes part of the cryptographic hash in the next block, so data cannot be altered retroactively without changing all subsequent blocks that show that data. It essentially creates a digital ledger of transactions that is duplicated and distributed across a network of participating computer systems.

Unlike Bitcoin for example, which is a public-permissioned blockchain, food safety blockchains would be private-permissioned, meaning that only authorised users can access the data, and they can only access the parts of the data that they are authorised for. The technology is considered secure and incorruptible.

Systems, devices and sensors that are capable of automated machine-to-machine communication can all be part of a blockchain system, and this includes food safety machines such as product inspection devices. Indeed, some of these are operating in exactly this way in the IBM Food Trust blockchain examples already stated.

The key point is that food manufacturers do not need to have specialist blockchain experts within their organisations to allow them to tackle digital supply chain issues as they can learn the trade. The starting point is data: as long as it is collected and stored in a database, it can be retrieved and encrypted by a technology platform provider during an on-boarding process.

Starting steps

How should food manufacturers approach the need to start developing a digital food supply chain? There are a number of steps:

- Start auditing the nature of the food transformation data gathered in the plant and investigate if they are collecting the necessary data for digital track and trace at batch level.
- Look strategically at how this data is collected and stored. Analogue technology must be replaced with digital technology. If possible, manual processes need to be automated; data held on local servers should be migrated to a data hub on the premises or to the Cloud.
- Start talking to blockchain technology providers, to get a feel for the issues at stake and what can

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be achieved. IBM is currently the front runner here, but there are other potential providers. System suppliers such as those in product inspection can also help.

- Consider how to oversee the cultural changes that implementing this digital transformation will require within their organisation.

Many food manufacturers will find – perhaps to their surprise – that they are already in a good position to embark upon a process of transformation. The technology may seem complex, but its implementation is relatively straightforward. The change of culture, however, will need to be carefully managed.

Staff will need to understand and accept that, within the blockchain, other organisations will be able to see their company's data. The transparency will be real and immutable. Leadership will be required to drive change and demonstrate commitment.

Getting in good shape

By starting to adopt a more strategic approach to planning for future digital transformation of the food supply chain as described above, food manufacturers can ensure they are in good shape to make the transition, cost-effectively and with minimal business disruption, at a point when it becomes either necessary or desirable.

With initiatives such as the US Food and Drug Administration's (FDA) New Era of Smarter Food Safety and the Global Food Safety Initiative's (GFSI) Race to the Top making it profoundly clear that momentum for digital food track and trace is gathering speed, it is imperative that food manufacturers get ready.

Waiting until an optimum moment – for example, when the balance of cost and value for the business tips definitively towards the latter – might prove to be a luxury never to be enjoyed.

The moment to assess and identify the commercial benefits from a digital supply chain, as early adopters have discovered, is now.

Reduced waste and greater process efficiency might reasonably be expected from such developments, but less obvious gains might be just as attractive.

For instance, the use of blockchain technology can serve to reduce the potential for contract disputes. Data will be recorded automatically and give an undisputable picture of when service level agreements have been met. The prospect of these 'smart' contracts is likely to be of particular

interest to retailers. Insurance underwriters could use the data contained in the blockchain to reduce premiums, audit agencies might use it to reduce the frequency of onsite audits, and supply chain partners might see it as an effective way of monitoring contract packing companies.

Amidst the talk of blockchains and connectivity, of digital and data, it is easy to lose sight of what this technological transformation is all about. It is about providing a system in which batches of food can be quickly tracked and traced, and in which critical actions taken by companies dealing with that food in the supply chain can be proven and trusted. Ultimately, it is about demonstrating that the necessary due diligence has been shown along the supply chain – from farm to fork – to deliver safe food to the consumer.

It is unavoidable that there will be disruption and cost to food manufacturers as the industry transitions to a digital supply chain. However, it also needs to be recognised that early entrants will gain commercially.

A digital future is not just in the future, as the time to start counting and compiling, assessing, and progressing, is already here. ■

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