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Enhanced functionality in smart packaging

Technological advances in the food and beverage industry have led to the introduction of packaging functions beyond their typical use. *FoodBev* examines innovative smart packaging, including blockchain technology, and the variety of formats it can take.

Smart packaging can be defined as a combination of specialised materials, science and technology that provide added functionality. Often, the term is broken down into two elements: active packaging and intelligent packaging. While active packaging usually refers to an approach that helps maintain or prolong the shelf-life of a product, intelligent packaging comments on its ability to detect any changes and to act on it.

With the support of digital technologies, packaging is gaining new functions and the list is endless. From extending a product's shelf life to improving food and customer safety, various advantages are offered by smart packaging. Not to forget, the ability to unlock supply chain efficiencies and make information more accessible to the end consumer. The implementation of smart packaging by food and beverage manufacturers has resulted in a more interactive experience for consumers and an increasingly more transparent one.

"The prevalence of smartphones has opened completely new opportunities to connect consumers and producers," said Jeff Bi, CEO and executive director of Greatview Aseptic Packaging. "It not only allows direct communication, but it can be individualised, is two-way and is in real time. QR codes in particular can deliver traceability, improve food safety, prevent counterfeiting, help in post-consumption collection and much more."

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Trust in product traceability

As consumers become increasingly aware of environmental issues and ethical sourcing, there is greater demand for manufacturers and brands to provide a transparent supply chain.

Richard Stockley, blockchain business development executive, global trade at IBM, told *FoodBev*: "Consumers are (rightly) demanding more from organisations that supply them. They are (rightly) perceiving that food fraud, food safety incidents, and poor sustainability outcomes shouldn't be the norm. The World Health Organisation (WHO) estimates that inefficient supply chain management and poorly-targeted food recalls result in one-third of all food being wasted."

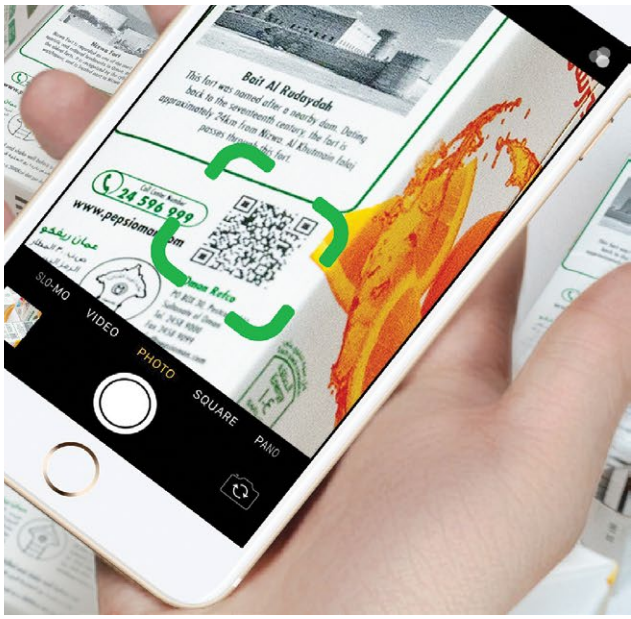
With QR codes and sensor technology, packaging systems can communicate details about a product's supply chain more effectively. This can help tackle food fraud, reduce the amount of food waste and extend communication channels between manufacturers, distributors, retailers and consumers, ensuring trust throughout each stage. "With the ability to trace the sourcing of ingredients and production process, consumers can be well-informed and this increases trust in brands," said Greatview's Bi.

IBM's Stockley shared a similar view around the importance of trusting brands: "Increasingly, consumers want the things they buy to reflect their own values. A recent IBM global study highlighted that 71% of consumers indicated that traceability was important to them and were willing to pay a premium for brands that provide it."

Blockchain technology

"Wherever an asset can be digitised, blockchain can bring a greater level of trust," said Stockley. "A blockchain is a tamper-evident, shared digital ledger that records transactions in a peer-to-peer network. Distributed to all member nodes in the network, the ledger permanently records, in a sequential chain of cryptographic hash-linked blocks, the history of transactions that take place between the peers in the network."

Companies often have limited visibility of their extended supply chain, therefore, implementing blockchain technology can add value by verifying the origin and authenticity of the end product and



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the ingredients used. Due to greater technological skills, Stockley emphasised that consumers wish to move away from simply the perception of trust and instead are choosing to rely on proof. He told *FoodBev* that blockchain technology can offer evidence-based transparency.

IBM Food Trust, the company's blockchain food safety solution, connects participants across the food supply chain and allows the secure sharing of information. "This trust is made possible by only enabling permissioned access to a shared, distributed ledger. Each party can only see the data they are approved to see," he added.

"By enabling permissioned access to a shared, distributed ledger, blockchain can enable competitors to work together toward mutual goals without compromising proprietary data – leading to greater economic efficiency, less administration and friction, and more trust and speed."

Evidence in the industry

MarketsandMarkets has estimated that the global blockchain market size will grow from $3 billion in 2020 to $39.7 billion by 2025.

IBM now has over 300 organisations on the Food Trust Platform. The firm has worked with several of the largest food companies such as Nestlé, Unilever and Tyson Foods and has recognised its broader applications beyond improving food safety. This includes its ability to educate consumers about the origins of a product, its support for the farmers who grew the ingredients used, as well as protecting the authenticity of a regionally unique product.

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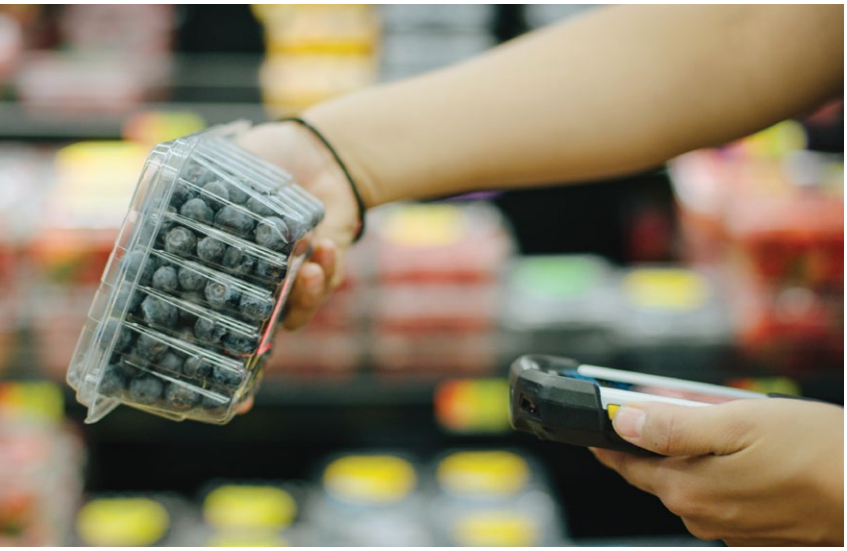

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Stockley highlights the example of IBM's client, Kvarøy Fiskeoppdrett in Norway, which uses the platform to distinguish its high-quality brand of pollutant free arctic salmon, demonstrate its authenticity and share the story directly with its customers.

"In the case of Kvarøy Arctic, consumers can use the QR code on the packaging of their farmed salmon to find out more about the fish on their plates: Where they were farmed, what the fish were fed, when the fish were born, when they were harvested and what was done to preserve during transport," he said.

"Video and images of the fish farms and even recipes can be shared, further enhancing consumer trust and strengthening their connection to the producer of their food."

Interactive experience

As more companies want to demonstrate their sustainability credentials, smart packaging that implements blockchain technology is currently dominating the industry. Nevertheless, consumer brands are increasingly looking to capitalise on the personalisation trend and are beginning to offer interactive experiences as a marketing ploy through the use of smart packaging.

Take, for example, cloud-based traceability platform Kezzler and packaging firm Amcor's partnership with Mondel□z in the offering of a personalised Toblerone. Through a QR code, consumers were able to send personalised video messages to the recipient of the gift.

For Greatview, at the core of smart packaging is its means to connect. "Through smart packaging, brands can deliver much more information than can be printed on the product itself, and they can interact with their customers in a way that wasn't possible just 10 years ago," said Bi.

"It isn't all about traceability though, smart packaging gives brands the opportunity to conduct far more engaging marketing campaigns than before.

"In this digital world, more and more consumers are online and the e-commerce environment is becoming increasingly competitive for brands as well. Smart packaging provides a simple and effective way for brands to add value and diversity to their brand image and products."

In 2015, the aseptic processing company launched Greatview Smart Packaging, a solution that allows the printing of text, images and QR codes that are completely unique to each individual package. Bi told *FoodBev*: "Through the use of digital print stations integrated into an existing printing press, we have been able to achieve complete individualisation, which provides brands with new opportunities to reach and interact with consumers,

as well as providing unprecedented insight into the supply chain of liquid products."

Greatview has worked with more than 50 customers around the world to implement its new technology in their products. "In Oman, the Topfruit juice brand from the Oman Refreshment Company, a PepsiCo licensee, launched an exciting scan-and-win campaign that made use of our variable printing technology with QR codes. The campaign allowed their customers to win virtual stickers representing Omani landmarks and gave them the chance to win prizes through the campaign's app," said Bi.

"Meanwhile in Pakistan, Nestlé created an instant-win promotion on their Fruita Vitals juice brand, with rewards of mobile data using a scratch-to-reveal in conjunction with the variable print. In China, Mengniu provided their customers with the ability to trace the sourcing of their milk products and even the chance to view a livestream of the dairy farm by scanning the carton's QR code."

In a society that increasingly depends on technology, there is much in store for the future of smart packaging. "The fast development of e-commerce and growing trend of online shopping have made smart packaging an indispensable tool for brands to drive and convert the traffic from offline to online.

"In general, consumers are expecting a more individualised consumption experience and smart packaging will be at the forefront of allowing brands to keep up with these challenging demands," Bi concluded.

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