FOOD YOU TRUST: HOW BLOCKCHAIN WILL REINVENT THE SUPPLY CHAIN

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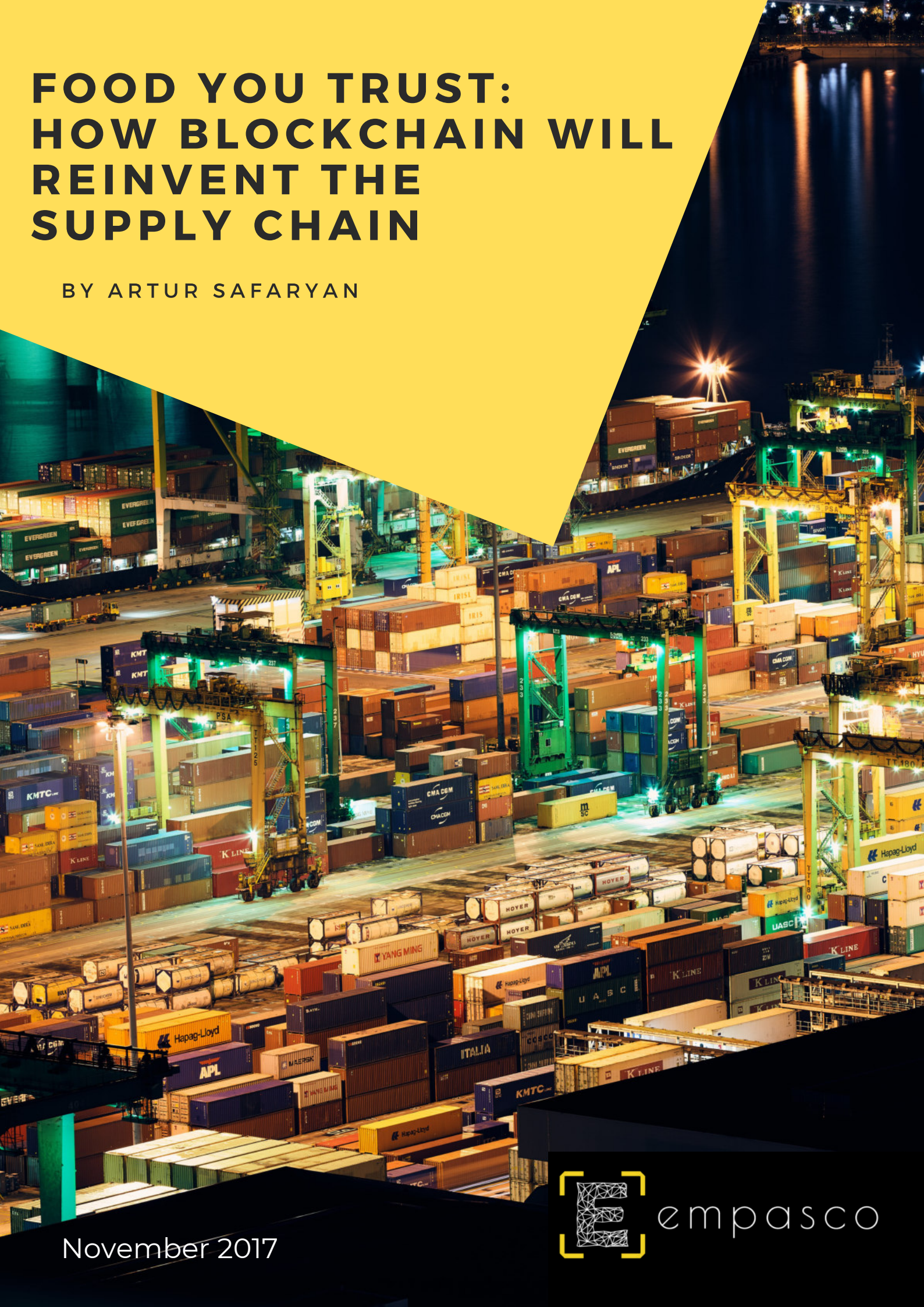

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CURRENT STATE OF THE SUPPLY CHAIN

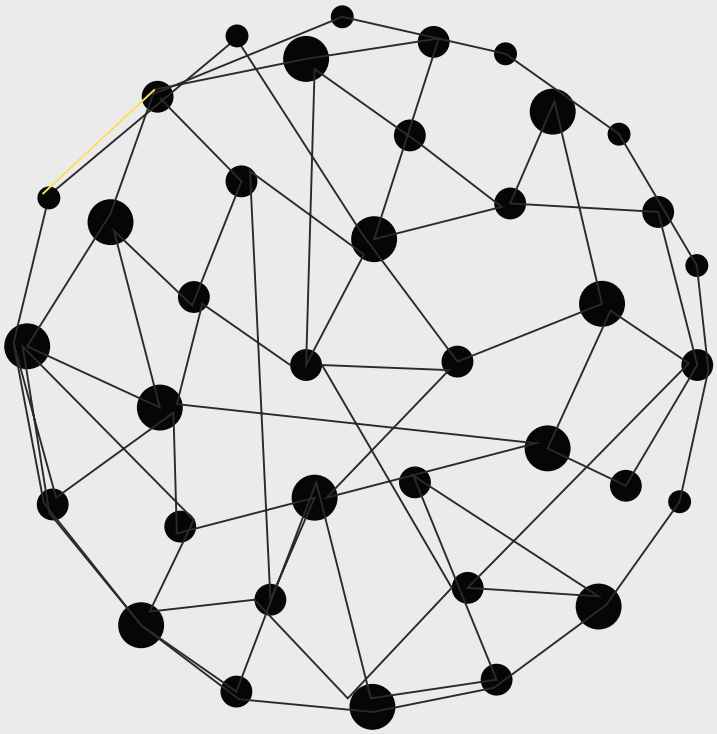
On October 1st, the UK's largest supplier of supermarket chicken, 2 Sisters Food Group, temporarily suspended production of chicken at its West Bromwich plant following an undercover investigation by the Guardian and ITV News that found evidence of food safety records being altered. The 2 Sisters produces a third of all poultry products eaten in the UK and supplies all top five UK retailers including Tesco, Sainsbury's, Marks & Spencer, Aldi, and Lidl. By altering "kill dates" 2 Sisters aimed to artificially stretch the commercial life of the meat and trick customers into buying the product past its use-by date.

The underlying problem in the 2 Sisters crisis, similar to the 2013 horsemeat scandal, is the dependence of retailers on multiple suppliers to deliver products and ingredients. More accurately, the problem of lack of transparency and accountability across complex supply chains. With no possibility of monitoring the supplier in real time, none of the UK's top grocers were able to identify the practice of changing "kill dates" nor prevent the expired produce from reaching the consumer. Marks & Spencer, Aldi, and Lidl have all suspended supply from the West Bromwich site. A reactive and inadequate solution to a recurring problem.

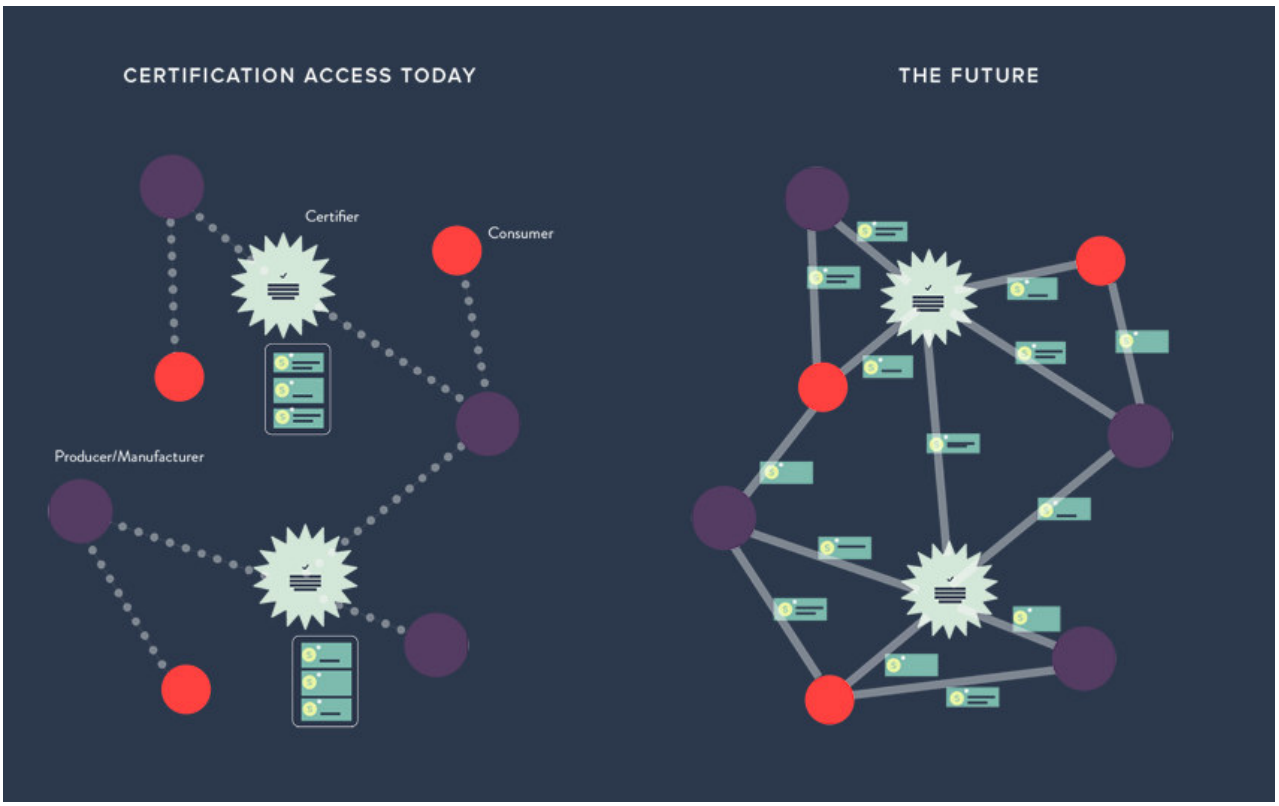
ALTERNATIVE SOLUTION: BLOCKCHAIN

Today, a vast number of projects are focused on solving the problem of supply chain complexity and distrust with the use of blockchain technology, the digital ledger technology behind Bitcoin and other cryptocurrencies. Aside from its disruptive applications in fintech, blockchain has a very real potential to fundamentally change the supply chain processes. With this in mind, vice-chairman of Barclays Corporate Banking, Jeremy Wilson refers to blockchain as the new operating system for the planet.

With blockchain, a permanent and shared record of every transaction associated with an asset is created and constantly updated to a commonly shared ledger.



The Blockchain protocol allows for multi-party tracking of proof of ownership and transfer of ownership in real-time, machine-to-machine interaction and better-improved visibility of assets and liabilitiesalong the supply chain. All of the available data being public and encrypted, with no central database means no single company has control of the information. This, in turn, resolves problems of disclosure and accountability as the records of transactions become extremely difficult to remove, duplicate, manipulate, copy or tamper with.



Blockchain enables data certification by all actors rather than only the original certifier. (Source: goo.gl/Xr4QJR)

TRANSPARENCY – PREVENTION OVER CURE

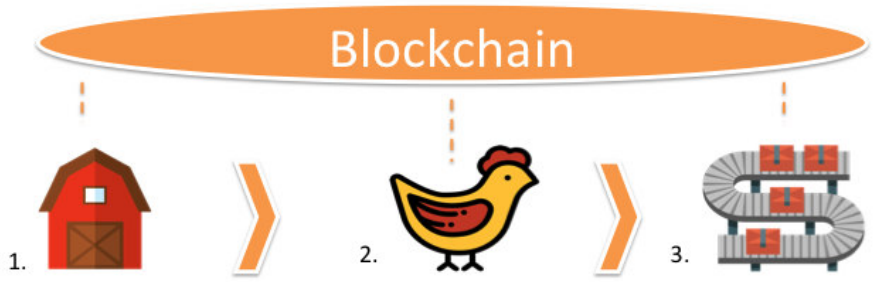
In short, a great description of blockchain is given by Michael J. Casey, the author of The Age of Cryptocurrency, who refers to blockchain as “a global system for mediating trust and selective transparency”. Casey argues that the implementation of blockchain in trade could lead to a shift of paradigm from current supply chains to more advanced demand chains.

Blockchain will not only enable transparency of the asset’s current location but also create traceability of the whole journey. Tracking provenance of goods on the blockchain results in lower risk and higher bar on quality in production and distribution. Taking the supply chain of supermarket chicken as an example, the potential of end-to-end enabled blockchain becomes apparent.

In response to the producer’s malpractice of changing “kill dates”, retailers could implement a blockchain solution to track the meat along the whole supply chain and provide full product-related data to customers. With a simple QR-code scan customers would be able to follow every step the chicken meat has gone through in the supply chain, and compare that journey to their desired production and distribution process.

As Oliver Wyman highlight, all of the historical and real-time data on the chicken product, whether related to the origin (feeding or breeding), timing (aging duration, time in transport, best before date),location (of the farm and of the chicken throughout the supply chain) and any additional information (FSA safety ratings, etc) are made continuously available through the blockchain database in a common, shared and consistent record ("one source of truth")

End-To-End Blockchain-Enabled Supply Chain (Part 1)



Supplier

- Uploads data on antibacterial fodder
- Chicken tagged with RFID chip; provides free range

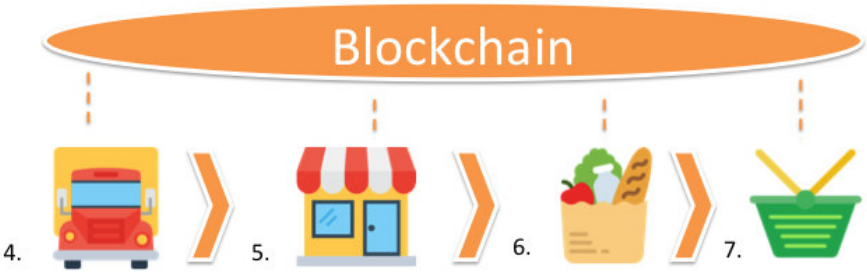
Producer

- Gets information on required cuts; prepares meat accordingly
- Adds QR code to packaging

Distributor

- Automatically receives notifications about receipt of chicken products
- Choses best suited 3PL based on all available customer data

End-To-End Blockchain-Enabled Supply Chain (Part 2)



3PL

- 3PL (Third Party Logistics) is informed about origin an destination of the product
- Is given instructions on how to store the product

Retailer

- Runs machine learning based forecasting
- Adds updates to data records
- Provides app for final customer

Store

- Has full transparency on delivery time
- Adapts orders, promos etc accordingly

Customer

- Scans QR code via app
- Gets insights into origin of the chicken product; ageing; duration etc

In the case of 2 Sisters chicken, the practice of changing “kill dates” would have been avoided if such blockchain tracking solution had been implemented by retailers as every chicken product would have been registered on the database from step one. The 2 Sisters Food Group would be unable to tamper with the data on the blockchain. The company would, alternatively, be able to create a fake tag and run it through the supply chain without a chicken product for the sole purpose of attaching it to a faulty product at the final stage of the process. In theory, this would only work if 2 Sisters, or any other noncompliant organization, owned 51% of the network, which is unlikely to be the case given the complexities of the modern supply chain.

Ultimately, the expired products would have to be disposed of rather than being sold to a different retailer under an updated tag. The transparency achieved by implementation of a blockchain solution in tracking the provenance of goods would radically raise the bar on quality in production and distribution and reduce the risk for retailers and consumers. However, on the road to blockchain implementation companies will have to overcome significant obstacles.

One of the challenges lies in the development of common governance of the technology. Although the blockchain technology implies open innovation and open access, closed ledgers run by a consortium of companies will inevitably arise. Interoperability across private and public blockchains will take shape, which will require shared standards and commercial agreements between all actors. Additionally, the complex array of regulations that currently govern rights of ownership across international borders and jurisdictions will have to adapt to the automated and decentralized nature of 'smart contracts'. In spite of all the obvious challenges, an increasing number of investors, startups, academics and governments view blockchain as the next step in economic renewal.

ONGOING PROJECTS

One of many startups aiming to solve supply chain transparency is a UK startup, Provenance. Provenance is a software company focused on helping businesses that make and sell products share information about the people, places, and materials that create those products by combining NFC tags and blockchain technology. Jessi Baker, the founder of Provenance, highlights one of the main advantages of blockchain technology as its ability to communicate information peer-to-peer, unlike today when you need a third party to broker the information.

As its pilot programme, Provenance used blockchain in Indonesia for tracking tuna fish from catch to consumer to create traceability in such complex supply chain as the Southeast Asia fishing industry. More recently, Provenance worked with Co-op, UK food retailer, in tracking gladioli flowers from source to shelf.

More than just startups, technology giants too, are trying to make the most of the blockchain revolution. IBM has developed its own software solution for supply chains based on the Hyperledger Fabric focusing on three key aspects: Visibility (shared and trusted planning and logistics data), Optimization (decisions synchronized across the supply chain in real time) and Forecasting (customer demand data available to all). Most recently, IBM has demonstrated the potential of its blockchain solution by partnering with Walmart. Earlier this year, at a meeting of shareholders, Frank Yiannas, vice president for food safety at Walmart, demonstrated the process of tracking food in a matter of seconds using the IBM solution.

IBM has also unveiled a partnership with Maersk, global transport and logistics giant, in developing a supply chain solution more specifically tailored for the shipping and logistics industry. The solution will help in management of the paper trail of tens of millions of shipping containers globally by digitizing the supply chain process. At scale adoption of blockchain solutions has the potential to solve the food, transport and logistics industries billions of dollars. When presenting the new model of global trade, Bridget van Kralingen, IBM Senior Vice President Industry Platforms, highlighted the challenges facing the supply chain and logistics industry by saying “we believe that this new supply chain solution will be a transformative technology with the potential to completely disrupt and change the way global trade is done”.

Looking at solutions being developed by IBM and Provenance, as well as many other companies, it becomes apparent how much disruption awaits the supply chain industry in the near future. However, only considering these two providers would merely constitute scratching the surface of the blockchain revolution in supply chain. Some of the other examples include Everledger, another UK startup focused on tracking the provenance of diamonds aiming to solve the problem of “blood diamonds”, or modum.io, a company that combines IoT (“Internet of Things”) sensors with blockchain technology to provide data integrity for transactions of physical products.

FINAL THOUGHTS AND RECOMMENDATIONS

The above solutions provide a clear picture of just how much supply chain processes can be improved through implementation of blockchain solutions. Optimization and forecasting can save billions across industry. Adding transparency can further generate profit for first-mover companies. For example, since John West, tuna fish supplier, started including 'Can Tracker' codes on their tuna cans enabling consumers to trace the product back to the fisherman, the company has generated additional £17m in sales.

Ultimately, however, the blockchain revolution should be directed at creating new and distinct value for partner organizations and the final customer. With almost 1 in 10 people falling ill every year from food contamination, according to the World Health Organisation, distributed ledger technologies enabling product traceability currently present the best solution to the problem.

Now that food industry regulators have widened their investigation into the 2 Sisters Food Group to 12 industry plants, it has surfaced that government agency had previously been notified of the practice of changing “kill dates” by company’s workers back in 2009. When commenting on the more recent unfolding, Heather Hancock, the FSA chairwoman, said: “Consumers deserve food they can trust and can be reassured that we take allegations of poor practice very seriously”. It has now been 8 years since 2 Sister’s workers first raised the issue of false labelling and the problem continued recurring. Perhaps the next 8 years will show whether blockchain is able to deal with such occurrences better than the FSA has done so far. As for now, stay safe and be careful with what you eat.

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