Evidence Report

APPG BLOCKCHAIN

UK Parliament

AGRICULTURE AND FOOD

Blockchain applications - regulation, policy & strategy

appg

ALL-PARTY Parliamentary Group on Blockchain

2020 FEBRUARY

BIG INNOVATION CENTRE

Sponsors of APPG Blockchain

The Group supporters – Big Innovation Centre, British Standards Institution (BSI), Capita, CMS Cameron McKenna Nabarro Olswang, INDUSTRIA, IOTA Foundation, My Next Match, and SAP – enable us to raise the ambition of what we can achieve

www.biginnovationcentre.com | info@biginnovationcentre.com | @BigInnovCentre
www.appg-blockchain.org | appg-blockchain@biginnovationcentre.com | @appg_blockchain

Table of Contents

1. APPG on Blockchain Evidence Meeting – Agriculture and Food.

1.1. Purpose

The mission of the All-Party Parliamentary Group on Blockchain (APPG Blockchain) is to ensure that industry and society benefit from the full potential of blockchain and other distributed ledger technologies (DLT) making the UK a leader in Blockchain/DLT's innovation and implementation.

This Evidence Report explores the uses of Blockchain technology in the Food and Agriculture Sectors.

The report provides a summary of the takeaways from the meeting. The Video recording of the session is available on our websites APPG Blockchain https://www.appg-blockchain.org/ and Big Innovation Centre https://www.biginnovationcentre.com/

1.2. Details of the Meeting

- Date, 11th February 2020
- Time, 17:30 – 18:30pm BST
- Location, Committee Room 16, House of Commons, UK Parliament
- Participants, 75 attendees

1.3. Discussion Questions

Questions for Discussion at the meeting were:

- **How can the agricultural industry harvest the benefits of blockchain technology?**
- **How will Blockchain applications for Agriculture revolutionise the Food Supply from farm to plate?**
- **Can blockchain capabilities improve the sourcing of information, produce treatability and fair payments in the sector?**
- **Can this empower customers in the supply chain with data they can trust, reward the producers, and lead to sustainable farming practices?**

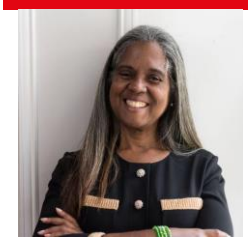
1.4. Panellists: Evidence Givers, Chair & Secretariat

The meeting was Chaired by APPG Blockchain Chair Martin Docherty-Hughes Member of Parliament and the Vice-Chair Lord Waverly, Member of the House of Lords.

Big Innovation Centre is the Secretariat for the APPG on Blockchain, led by CEO, Professor Birgitte Andersen and Fernando Santiago-Cajaraville as the Rapporteur.

The meeting brought a total of five evidence givers. Different use-cases were presented at the meeting by Trazable, inFuture and AgriLedger. The regulatory and academic point of views were brought by the Food Standards Agency and the University College of London, respectively.

Evidence Givers



Genevieve Leveille
CEO

AgriLedger

Lucas Salinas
CTO

Trazable

Michael Fridman
Partner

inFuture

Neil Ashworth
Enterprise Architect, UK & Ireland

SAP

Julie Pierce
Director of Openness Data & Digital

Food Standards Agency

Geoffrey Goodell
Senior Research Associate

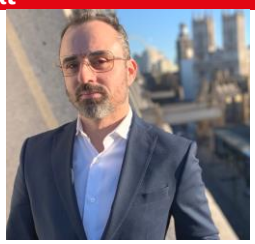
University College London (UCL)

Chair

Martin Docherty-Hughes
MP
House of Commons, UK Parliament

Secretariat

Professor Birgitte Andersen
CEO
Big Innovation Centre



Fernando Santiago-Cajaraville
Project Manager
Big Innovation Centre

2. Food and Agriculture: A Global Market

From left to right: Martin Docherty-Hughes MP, Professor Birgitte Andersen, Genevieve Leveille, Lucas Salinas and Michael Fridman.

By the end of the twentieth century, globalisation, increased the number of transnational companies from 38,000 to 79,000 between 1995 and 2007, and the number of subsidiaries from 265,000 to 790,000, spreading the food supply chains all over the globe.

"Feeding a growing population, providing a livelihood for farmers, and protecting the environment are some of the greatest challenges facing the world today". *(G. Leveille, AgriLedger)*

Looking at the food supply chain as an integrated system of physical flows, information flows and relationships (Wilding, 1998), the globalisation has dramatically impacted all the three flows and have raised the complexity of the Supply Chains (SC). This complex global food system is expected to provide safe and nutritious food to the population that will grow from 7.5 million today to nearly 10 billion by 2050. In the UK, 50% of the food is imported.

The increase in the complexity of the food supply chains has also eroded the ability of the companies to track their products, as recent mainstream news about traceability issues in the food supply chain have denoted the companies' difficulties to attain End-to-End traceability. The "Horse Meat Scandal" was a case in point, when beef products from some suppliers were found to contain undeclared or improperly declared horse meat, in some cases as much as 100% (Butler, 2013).

The UK's Chicken Scandal (Goodley, 2017), where a chicken retailer mixed different poultry from various providers and repackaged it with new "use by" dates. These incidents have brought into the mainstream, the problem of the leading retailers controlling their Supply Chains.

"We should have in mind that half our food is imported; therefore, we should not just look at a narrow UK production world." *(J. Pierce, Food Standards Agency)*

Subsequently, these scandals have increased public concerns about the provenance and sustainability of products. In response, governments have enacted regulations to increase the transparency and traceability of large retailers' SCs. For instance, in 2015, the UK Government approved the UK Modern Slavery Act 2015, which expands the responsibility of retailers towards their complete supply chains. (Gov, 2015).

The retailers, with the regulation in place, are now taking measures to improve transparency and traceability of the chain. The supply chains are implementing and exploring new technologies to manage the complex amount of data across the supply chain.

Although there are attempts and supporting regulations in place, traceability of the food supply chain is increasingly more difficult, and in need of new solutions to be tested. The new solution to ensure the food all eat is safe, unifying the traceability information within the supply chains

"The world needs more food to meet a growing population."
(M. Fridman, inFuture)

Distributed Ledger Technology, more commonly known as Blockchain technology. The technology is considered to have the potential to solve the critical problems of traceability and visibility on the supply chain (Economist, 2017).

From left to right: Fernando Santiago-Cajaraville, Lord Waverly Martin Docherty-Hughes MP

References

Butler, S. (2013). "Analysis: horse meat scandal delivers supply chain lessons

Goodley S (2017). "Scandal-hit 2 Sisters suspends chicken production at West Midlands plant"

Gov, H. (2015). "Transparency in supply chains etc. A practical guide."

Wilding, R. (1998). "The supply chain complexity triangle: Uncertainty generation in the supply chain"

3. Meeting Takeaways

3.1. From Farm to Fork. Blockchain improves Traceability and Visibility

Blockchain can provide a clear benefit on the traceability of the Food and Agriculture Supply Chains. Blockchain allows a single, immutable and distributed version of the traceability records. The entire journey of the materials is recorded on the distributed ledger, including properties, events and transactions. These characteristics allow removing the data silos for the supply chain and increasing the efficiency of the information flows.

Blockchain provides an excellent tool to improve the transparency of the food and agriculture industry. The implementation of Blockchain solutions on the Food and Agriculture industry can increase food safety by showing the provenance of the products. The efficiency of the supply chain can be improved, removing the current frictions of the system (e.g. cross borders) or improving the match between supply and demand

---

"The main benefit it has is fast and efficient access to reliable traceability data."
(L. Salinas, Trazable)

"Blockchain technology improves information transparency and accuracy, thus increasing trust between parties reduce costs and boost efficiency"
(G. Leveille, AgriLedger)

"Having the information in a unique and immutable digital ledger, traceability data can be accessed in seconds instead of days. "
(L. Salinas, Trazable)

From left to right: Michael Fridman and Neil Ashworth

3.2. Bank of Opportunities

Blockchain applications on the Food and Agriculture industries have many potential benefits, from mobile payments to improving the finance supply chain. Blockchain application can be used to,

- Generate better access to the markets for small farmers
- Ensure fair and automatic payments
- Reduce friction in the import and export at the borders

"Blockchain can provide the opportunity to take away frictions at the UK borders."
(J. Pierce, Food Standards Agency)

"Blockchain can be used to ensure fair payments depending on the will of the industry."
(L. Salinas, Trazable)

"The context of DLT in agriculture and food products has been one of the most active areas of discussion going back a few years now in the UK." *(G. Goodell, UCL)*

3.3. Data standards are the key

Industry data standards have not yet been established for the implementation of blockchain on the Agriculture of Food supply chains. Platforms, system architecture, and consensus protocols are still being tested.

Data standards should be agreed prior to a Blockchain implementation. Once agreed, Blockchain becomes one of the fastest and easiest technologies to deploy. Without data standards, it could take years to understand the potential of Blockchain fully.

"We have to consider the importance of data standards and trust models before a Blockchain implementation." *(J. Pierce, Food Standards Agency)*

3.4. The Ecosystem at the Centre

Food or Agriculture supply chains are formed by multiple stakeholders. Multiple stakeholders need to be able to use the system without some a central gatekeeper; Blockchain networks should open to all the stakeholders.

The success of a Blockchain implementation will rely on the ecosystem. Collaboration and goodwill trust are crucial among the members of the food or agriculture supply chain. These two factors will impact the degree of information sharing and consequently, the success of the implementation.

"Food is not a single monolithic provider or controller; Blockchain should be it neither. Keep Blockchain open to all the ecosystem players." *(J. Pierce, Food Standards Agency)*

"Projects that focus on developing ecosystems should be encouraged and supported." *(M. Fridman, inFuture)*

"DLT technology is about multiple stakeholders." *(G. Goodell, UCL)*

From left to right (table across) Genevieve Leveille, Lucas Salinas, Michael Fridman and Neil Ashworth

4. Evidence Giving

Creative transcripts, prepared for presentation purpose, of the evidence giving at the APPG Blockchain meeting on 11th February 2020 are listed below.

4.1. Genevieve Leveille, CEO, AgriLedger

Genevieve Leveille

AgriLedger is a platform that brings much-needed transparency along the agricultural value chain and builds trust among all stakeholder. The platform enables full traceability of products from end-to-end tracking and all related financial obligation and facilitates the immediate distribution of payments to participating actors.

The global food system:

The global food system has to provide safe and nutritious food to the growing population, from 7.5 million today to nearly 10 billion by 2050. The UN acknowledges the importance with its sustainable development goal number 2 of ending hunger, achieving food security, and improved nutrition while promoting sustainable agriculture.

"Feeding a growing population, providing a livelihood for farmers, and protecting the environment are some of the most significant challenge facing the world today."

The three challenges mentioned above must be tackled together to achieve the larger good in the food systems. As much discussed for the less developed world, these challenges are also applicable to the developed world.

If we look at some of the countries in Africa, many farmers lack access to formal banking opportunities which limits the funding options. For instance, borrowing for seeds, fertilisers, and other essential needs is difficult during the plantation season. As a result, over 50 per cent of the harvest value is lost between harvest and selling point.

Blockchain Technology & Agriculture:

Driven by the desire to create transparency, reduce operational costs, and improve global food safety, the next generation of software architecture is cropping in provenance. Payment system for daily fare like mangoes in Haiti, organic huts in Australia, free-range beef in the United States, and chicken in China. Strengthening the skill and capacity of local farmers to achieve food security and market inclusion

---

"Blockchain technology improves information transparency and accuracy, thus increasing trust between parties reduce costs and boost efficiency."

Thanks to these benefits, blockchain technology could be the key to transforming agricultural commerce.

The market demand for such a solution in a global food supply chain is expected to grow over 360 billion by 2026 and surged more than 3.1 trillion by 2030, according to Gartner

Resolving the critical agricultural supply chain:

With Blockchain technology, we have developed the AgriLedger solution to address this issue and changed the narrative. We are looking at Africa because it is the breadbasket of the world.

Technical inclusion that aims to positively disrupt the African agricultural ecosystem. We secure a modular blockchain enterprise solution that is designed to address the key supply chain issues of weak infrastructure and logistics, documentation, cost, lack of transparency and ability to trace product as they move through the value chain.

The key components are:

- Fully traceable
- Instant payment
- Digital identity
- Integration with IoT

- Project journey
- Smart contract enabled.

The implementation of the blockchain solutions can achieve:

Seamless integration to the value chain and process across multiple systems that are controlled by several players. Transparency and traceability, product, and services, for the purpose of food safety, rules of origin, consumer information and building trust in the network.

Mobile payment for unbanked farmers, the statistics are there 1.7 billion unbanked with 3/4 of them having found why are they not part of the financial?. The system keeps track of all the invoicing along the value chain until the final user, facilitating faster payment, via smart contract.

Better access to market, domestic as well as global for farmers in Africa. Providing them with the right platform with the right players. Optimise and improve margins by giving them fair pricing and desired Financial Inclusion. The trusted and secure process from production to consumption addressing food safety issues throughout the value chain. Increase operational efficiency as a decentralised ledger single substitute is accessible by all players and provides seamless communication regarding what needs to be done whether that means harvesting, making storage, related adjustment ordering new equipment

Scalability as the tool deploy across commodities include corn wheat or vegetable cocoa cashew and cotton

Blockchain could bring significant saving in the commercial gain to agriculture but also one step further by setting farmer empowerment at the heart of the effort toward global food security ensuring that it focused on providing a livelihood for the farmers

With the correct inputs, fertiliser and seed have been made available to smallholder farmers in a sustainable manner. There are significant efficiency that can be gained in the production of the crop

When applying the same effort to the same acreage, the farmer can achieve four to five times bigger yield by using accurate data for monitoring throughout the cups crops life cycle is a game-changer. The four-fold increase in production consists take a substance farmer to the realm of reaping not only enough food but in addition, sell the excess to cater to his other needs.

Providing a reliable, secure and entrance track and trace from production to consumption, collecting data along the supply chain will deliver the solution on how to address the challenge highlighted, ensuring the consistency inequality of data across all commodity.

AgriLedger is doing a pilot project at this time in Haiti, with the mango where we are allowing the farmers to retain ownership. We have also applied for a DFID grant in Zimbabwe working with a consortium that includes OCP and Lima grain as made and major retailers and manufacturers will

support the optimisation of the value chain.

This is where we have looked at it as a strategy mostly for the developing market in my point of view it is really something that is needed for developed markets also very much so

In the same way, we used not to think we needed a cellphone; we were very happy to take our calls from home because that seemed efficient but once the cellphone took over and it was mostly leapfrogged in Africa.

Today in an announcement made by the government, the Rt Hon Michael Gove has announced that the smart trade borders will not be available until 2025, that means that we are going to see a lot of friction in the borders. Frictionless trade will not be happening until the end of 2021 at best.

HMRC suggests that the number of customs declarations will rise from 55 million present to about 200 million after Brexit. Part of that is because there isn't the technology that is necessary.

"There is an opportunity to look at Blockchain and those who can support this technology."

4.2. Lucas Salinas, CTO, Trazable

Photo: Lucas Salinas

We started our project at the end of 2017, aiming to unify the traceability information for each stakeholder that interacts in a supply chain.
The main goal was to change the way it communicates from snowball data workflow, where each stakeholder depends on the previous one, to a decentralised data workflow where each stakeholder has direct access to the current batch information anywhere in the supply chain.

We found Blockchain technology very interesting to solve issues like opacity and data retrieving delay originated in snowball systems.

"The main benefit it has is fast and efficient access to reliable traceability data. "

Every stakeholder can trust the source information because of its immutability once it is recorded. But notice that Blockchain technology is not meant to verify the information is being recorded.

IoT is a technology that can help ensure the data is being introduced in Blockchain, depending on the kind of industry it is applied in, IoT technology can have many advantages like triggering actions inside blockchain such as delivery or even tracking in different stages of a process.

Blockchain transactions can be publicly accessed, but it does not ensure fair payments, due to supply chain systems in blockchain varying from each other on how they are developed.

"Blockchain can be used to ensure fair payments depending on the will of the industry."

Blockchain can reward producers in terms of confidence due to transparency in their raw materials' origins and procedures. The more transparency in the raw materials' origin, the more rewarded sustainable farming practices will be.

It wouldn't be difficult to build a fast and efficient system to store the traceability data, but it wouldn't be reliable, that's what blockchain aims to fix. The immutability of the records, the truth about who was the owner of a specific batch in a given period, what processes it had, who was the next owner or even government-sanitary controls at a specific stage. In the end, a complete end-to-end supply chain solution.

Our system gives an identity to each stakeholder in the supply chain, then the stakeholder is able to create, transfer, and transform, a digital identity associated with a physical good. Once we can perform those actions to that digital identity, this is where we can say the item has been tracked, and then a tracked item can be traced back.

Due to the immutability, we can maintain the original game-rules under which companies and products are going to behave.

"Having the information in a unique and immutable digital ledger, traceability data can be accessed in seconds instead of days."

The key metrics in re-call processes are speed, and reliability and both of them are improved exponentially with Blockchain technology's adoption.

4.3. Michael Fridman, Partner, inFuture

Photo: Michael Fridman

"The world needs more food to meet a growing population."

High-tech agriculture is here, and it is a prerequisite for everyone within agriculture to be able to produce more food while reducing the climate footprint.

Through the research project "Future Farm", sponsored by the Norwegian Research Council, a consortium of key players within Norwegian agriculture have joined forces to develop Norwegian food and feed production,

- TINE (Dairy)
- Yara (Fertilizers and chemicals)
- Felleskjøpet Agri (Equipment and feed)
- Eurofins (Laboratory)
- inFuture (Consultancy)
- NMBU (University)

With an ambition to become a world leader in precision solutions, which utilise resources in the best possible way, the partners in the research project will strengthen and develop the competitiveness of Norwegian agriculture, and give the farmer ownership of future agriculture:

Farming today:

Today's farmer operates in a plethora of locked digital systems, making it challenging to have a holistic overview and often resulting in sub-optimization.

"The power of digital is not only about developing sensors and software but about integrating solutions across the value chain of the farmer."

One of the most critical parts of the dairy farmers value chain is cultivation (figure 1). It is estimated that deviation from best practice cost Norwegian agriculture hundreds of millions NOK annually. The lack of a national overview of supply and demand for grass and other forage crops also creates a high-risk situation with major consequences when facing environmental impacts like drought.

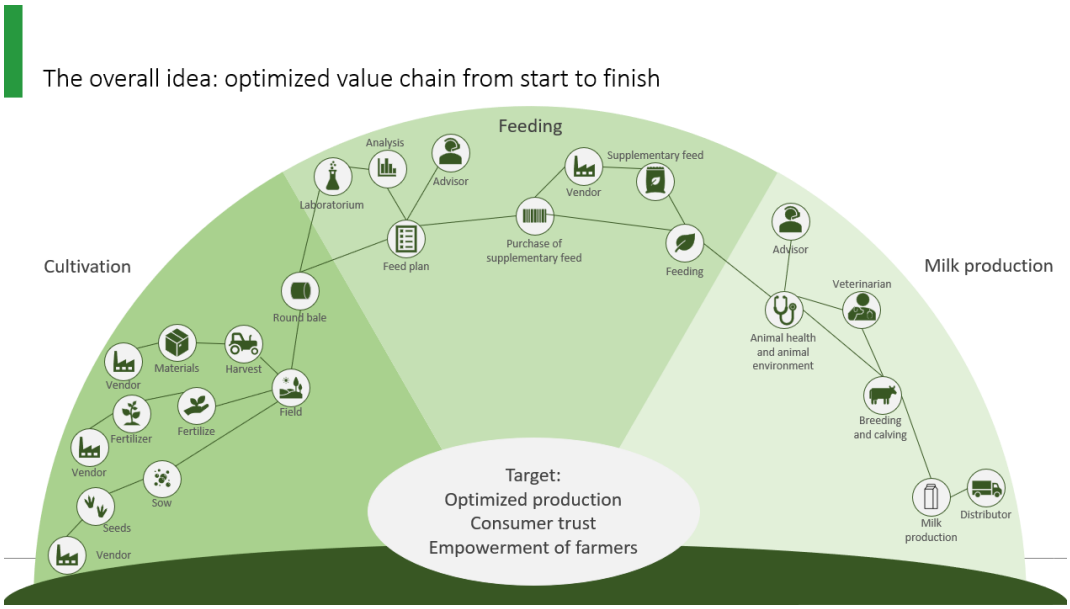


Figure 1 Presented alongside the evidence giving. The value chain of the dairy farmer

The project utilises blockchain in order to create a new data infrastructure for a shared truth and higher transparency between all parties involved: allowing the parties to collaborate closer than ever before. By thinking of the dairy supply chain as multiple eco-systems, the project is experimenting with developing interoperable modules based on blockchain, where each key product is surrounded by its own ecosystem (figure 2).

Together with IOTA Foundation, the project has digitalised the physical asset "Round Bale" (cylindrical bale of compressed grass) through a digital twin concept. This will allow farmers to manage their stock, purchase and sell round bales and ultimately create a national marketplace.

This is the first step in developing a cultivation ecosystem surrounding the round bale, which helps develop and improve services connecting fieldwork with animal husbandry – allowing a holistic optimisation of production. An early demo of this solution is accessible at https://future-farm.firebaseapp.com/#/.

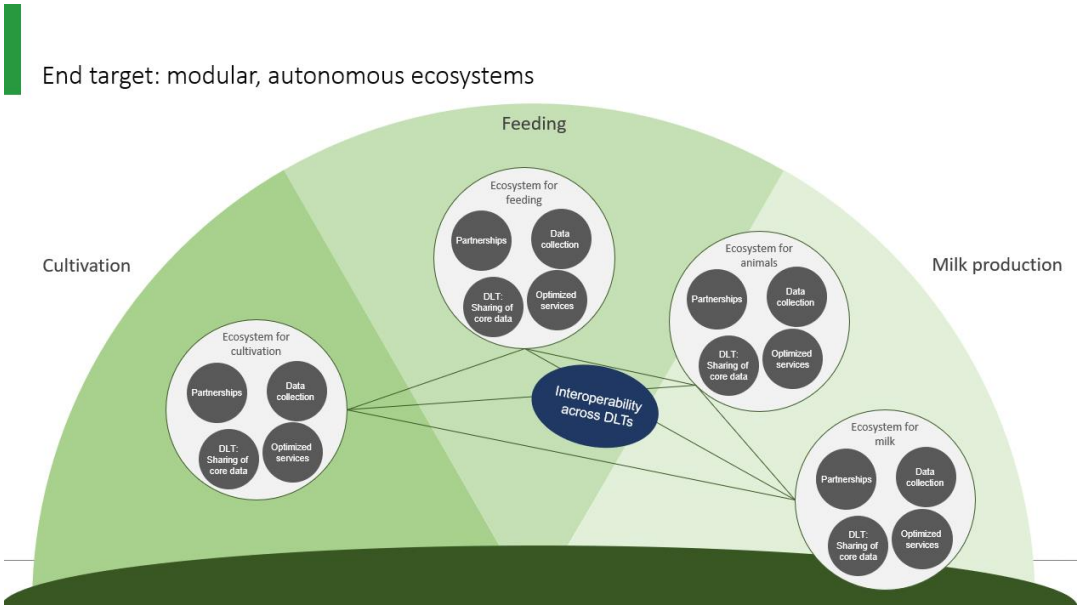


Figure 2 Presented alongside the evidence giving: The Autonomous Ecosystems

Policymakers recommendations:

The project recommends the government to effort within these areas

- **Competency** – Blockchain competency is scarce, education within the area should be improved
- **Tools for the private sector** –Projects that focus on developing ecosystems should be encouraged and supported: Support from the Norwegian Research Council has been vital
- **Public Administration** – The government should consider taking an active role in applying DLT within the areas governed by the state. This would allow for innovation across new sectors while maintaining public interests (e.g. blockchain-based food safety)

"Projects that focus on developing ecosystems should be encouraged and supported."

4.4. Neil Ashworth, Enterprise Architect, UK & Ireland, SAP

Neil Ashworth, SAP

SAP provides business solutions to around 25 industries worldwide. We have helped establish live blockchain networks and we are running multiple proof-of-concepts and pilots addressing different business problems.

"Blockchain can be seen ss an extension of business processes to either create new or extend the reach of existing business models."

Our standard solutions are being extended to include this integration to the blockchain world.

We endorse an open approach realising that for blockchain networks to succeed they need to embrace the ease of adoption and interoperability. Blockchain needs to integrate with other technologies such as analytics, workflow, mobile and IoT to deliver these solutions.

Since 2019-03-31 we have helped Bumble Bee Foods run a live pilot tracking and tracing tuna caught in Indonesia and sold to the US market, giving small fishing businesses greater reach, and ensuring ethical, safety and sourcing commitments.

We run a blockchain network for the Pharmaceutical industry to comply with the US Drug Supply Chain Security Act, live since 2019-01-31. Manufactured drugs are registered onto the blockchain. They are verified before being resold to prevent counterfeiting and ensure that only properly tested drugs are distributed. Currently holds more than 0.5 billion entries.

Since 2019-11-30 our Blockchain solution supports North American bottlers of Coca Cola to provide efficiency for bottler-to-bottler business transactions across the value chain.

"Blockchain can be an invisible network accessed using business systems. "

Now we have these ecosystems, the challenge is to integrate them and support the governance structure and regulators.

4.5. Julie Pierce, Director of Openness, Data & Digital, Food Standards Agency

From left to right: Julie Pierce and Geoffrey Goodell

"The Food Standards Agency exists for the consumer, to ensure that the food we all eat is safe."

The Food Standards Agency (FSA) is interested to explore the opportunities with blockchain technology. The FSA considers that it has two main roles to play:

- **The role as regulator**, as an actor in the chain within all of the blockchain applications
- **The role as part of the government**, in establishing standards, in pushing and driving for education.

"Blockchain banks lots of opportunities from different use-cases."

The Food Standards Agency is experimenting with Blockchain and has developed several pilots in different parts of the meat and agriculture sector. Some of the pilots focus on:

- Cattle into slaughter becoming beef
- Pork exports
- Wine import within the HMRC.

They are relatively small-scale projects but **real live pilots**. They have helped the Food Standards Agency to learn from experience.

However, considering that half of our food is imported, we should look beyond the UK production world. FSA is very mindful of food being imported and going forward.

Blockchain can provide the opportunity to take away friction at the UK borders. It also drives for increasing, not only the speed of the transactions but the flexibility of being able to move and trade differently. From our experience, blockchain would be an enabler to allow the FSA to do that (what?) within a different way.

Data and Trust Standards:

From our experience in the pilots that the FSA has carried out, all those "one-dimensional" blockchains were very interesting and quite easy to deploy. Having spent decades trying to deploy IT systems, the blockchain one-dimensional pilots were the fastest and the easiest to deploy.

However, they were easy because the FSA had the data standards already agreed. Without the data standards, the process would have been slowed down and going into the mire.

> ***"We have to consider the importance of data standards and trust models before a Blockchain implementation."***

The role of FSA, as government, will be to establish those standards and the trust models, who owns, who manages and how to trust the data.

Blockchain Ecosystem:

A blockchain running through a supply chain may be touching on multiple organisations. The challenge will be what happens when you try to get the blockchains to talk to each other, that is what food is.

> ***"Food is not a single monolithic provider or controller; Blockchain should be it neither. Keep Blockchain open to all the ecosystem players."***

4.6. Geoffrey Goodell, Senior Research Associate, UCL

When we refer to supply chains, we should refer to supply chains in the context of food and agriculture and manufacturing but not in a consumer context.

> ***"We must be very careful to not facilitate tracking and tracing of consumers, in a way that might undermine their privacy."***

It is particularly important when we consider any kind of tracking and tracing related to products that might be owned by a consumer, used again or resold. It might happen in the case of manufactured goods and probably less likely with agricultural ones, but not impossible.

In the context of agricultural and food products, transactions in supply chains include payments, handoffs, transport, and certifications. All of these kinds of functions can certainly be facilitated and monitored by Distributed Ledgers. Individual products can be compounded, for example, an agricultural product might combine ingredients or components from different sources, and this will happen not only for food products, that include different ingredients but also for food products that might involve, for example, a pig who was fed with a certain kind of grain.

The substitutes within these supply chains are important, we must imagine that these markets would allow for competition to be useful, and we would need to have some kind of a network of users.

> ***"The context of DLT in agriculture and food products has been one of the most active areas of discussion going back a few years now in the UK."***

In particular, there are a number of groups such as BBFA and others who have led working groups to discuss supply chains for food products, involving industry players and regulators.

Manufacturing is similar in many ways to the food industry, although there are different details, for example, the complexity of manufactured goods in the airspace industry might be a bit different in terms of the sourcing of its components, and the product security questions that you can ask about products such as mobile phones are also quite relevant. However, the questions are quite similar in parallel in both industries.

There are many benefits of using distributed ledger technology in the Food Supply Chain. DLT technology can help to:

- **Manage production and supply**, reducing or eliminating “Bullwhip effect” and allowing to manage the supply at different stages. DLT helps to get a universal view of the supply chains.
- **Assess the sustainability** of a supply chain and the various components within the supply chain.
- **Manage the contractual obligations** of different parties in the supply chain. Smart contracts can manage or facilitate payments and streamline the work of factoring companies.
- **Make use of trustworthy information** about the provenance of a product, the buyers at each stage or who have transported it. We can also imagine how DLT might improve the well-functioning of marketplaces for products by allowing us to answer questions such as whether the tuna does not have anything dodgy in the process of handoffs and throughout its production.

There is in all of these cases value to standards, for being able to satisfy a multitude of different use cases and identify the different kinds of transactions. There are a number of ongoing efforts that are important because we wouldn't be able to do this if it were not made into something that was globally (or at a minimum, nationally) recognised as a stakeholder-neutral way of doing this; otherwise, it just becomes a platform.

In platforms, we have one party sitting in the centre who is calling all of the shots, in this area is where the government should seek involvement.

Challenges:

“DLT technology is about multiple stakeholders.”

Multiple stakeholders need to be able to use the system without some a central gatekeeper, and without creating an N-squared problem, wherein all the different parties in the system need to establish bespoke relationships of all the other parties. This is really the problem that the industry has to address

Terms need to be established, such as Incoterms or the list of predefined commercial terms published by the International Chamber of Commerce. It will allow us to provide the framework for this by providing rules for transport, allocation of costs, buyers and sellers onboarding, customs tariffs, and so on.

Ultimately, the industry should ask itself **how to regulate such a network** and how regulation operates in cross-border transactions or who is in charge?. These questions will need to be addressed.

Who controls the network?

This is the hardest question; it is all about **governance**. An example is the experience of IBM and Maersk working together a few years ago. They built great technology, but ultimately a lot of the companies that prospectively might have chosen to work with them were concerned that the system might have been just their system (IBM & Maersk), owned, operated and controlled by them. Therefore, why would someone who might compete with them want to be involved?

The fact that we need to create this market infrastructure is the core question.

"We need to look at to co-regulatory solutions."

Insecurities markets, it has been done with "best execution", financial marketplaces for trading are a useful example. **How is competition preserved?** Ultimately it will be determined by whether regulators and regulatory touchpoints provide this neutral ground that prevents a particular market operator from dominating the system.

The core question to these different implementations of DLT is, "*Is this a platform that is provided by one company or one set of stakeholders in particular to the exclusion of others? or is this truly neutral?.".* It is hard to imagine such a system being really truly neutral without the involvement of regulators.

5. Contact details

APPG Blockchain Secretariat

Big Innovation Centre
62 Wilson Street
London EC2A 2BU
United Kingdom