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Blockchain in Agriculture Solving Agri-Food Supply Chain Issues with New-Tech

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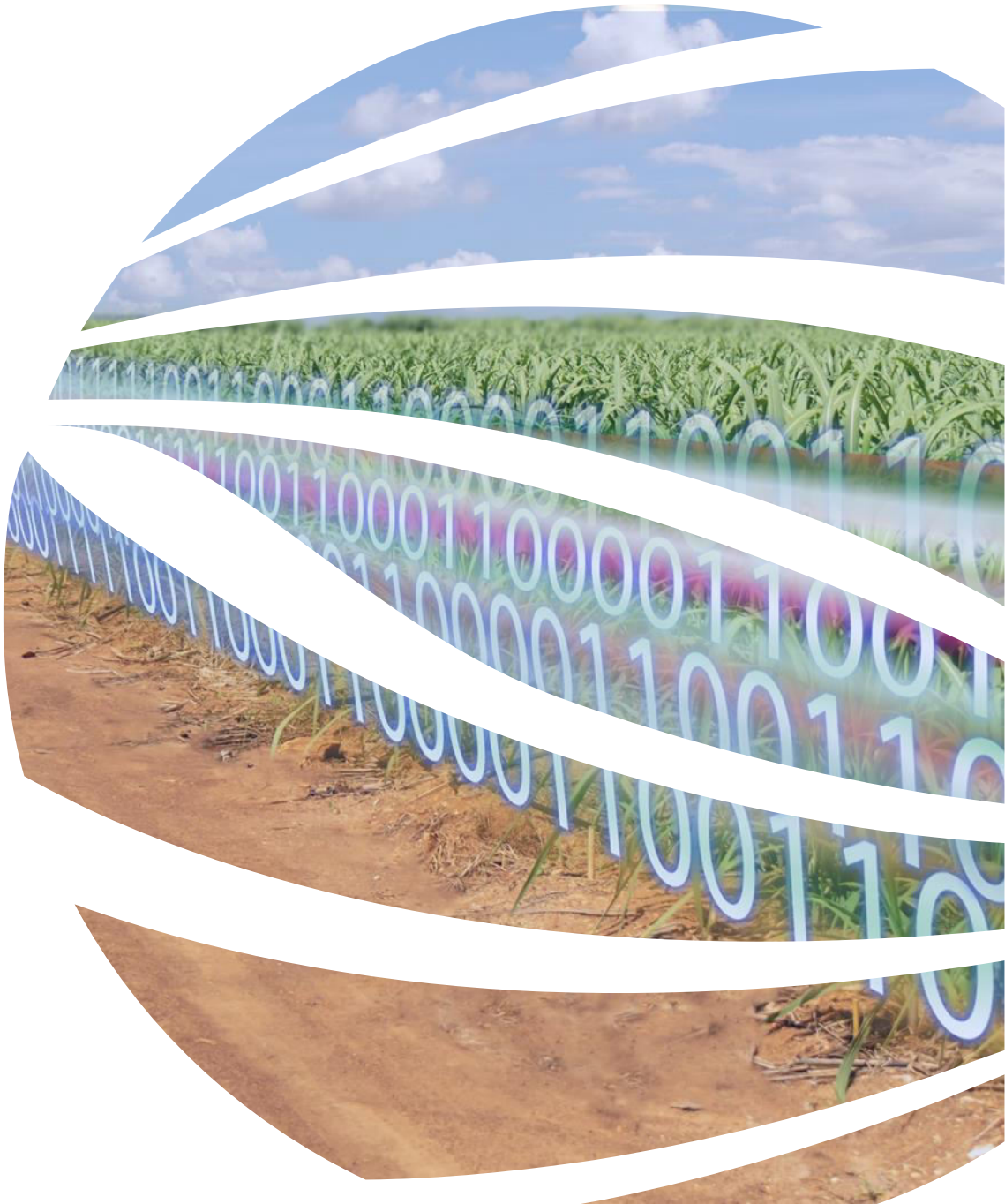

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Introduction

There are factors of the agri-food supply chain that can be addressed by implementing blockchain technology. Challenges ranging from consumer demand for more information and greater transparency around the food they buy, to record keeping and food integrity issues; this promising new technology may hold the answer.

The Agri-food supply chain

The global agri-food supply chain is an inherently complex system; evolving since the age of hunter-gatherers through primitive agriculture. Today it is a globalised system comprised of many moving parts that make it ever-more complicated. The European Commission predicted that by 2015 approximately 12 million farms would harvest agricultural products that would be processed by 300,000 enterprises in the food and beverage industry. These products would then be sold to 2.8 million enterprises within the food distribution and service industry to feed 500 million consumers within the European Union. With such a complicated journey for food to reach our plates, one can expect many information management problems along the way within the supply chain.

Some typical concerns faced by actors in the supply chain include a lack of coordination due to individualistic mindsets and biased opinions and a lack of transparency, which can lead to food security issues like the well-publicised horsemeat scandal of 2013. A study carried out by Chopra in 2007 shows that supply chain coordination needs to happen at each stage to avoid cost implications. Many researchers are now considering how blockchain technology could solve these problems to increase transparency and traceability within the system.

The Agri-food supply chain

In simple terms, blockchain is a digitised platform that stores and verifies transactions between users of a system. It is a shared ledger where one block represents one transaction, and it is decentralised meaning it can be accessed by all members of the system.

Quick read

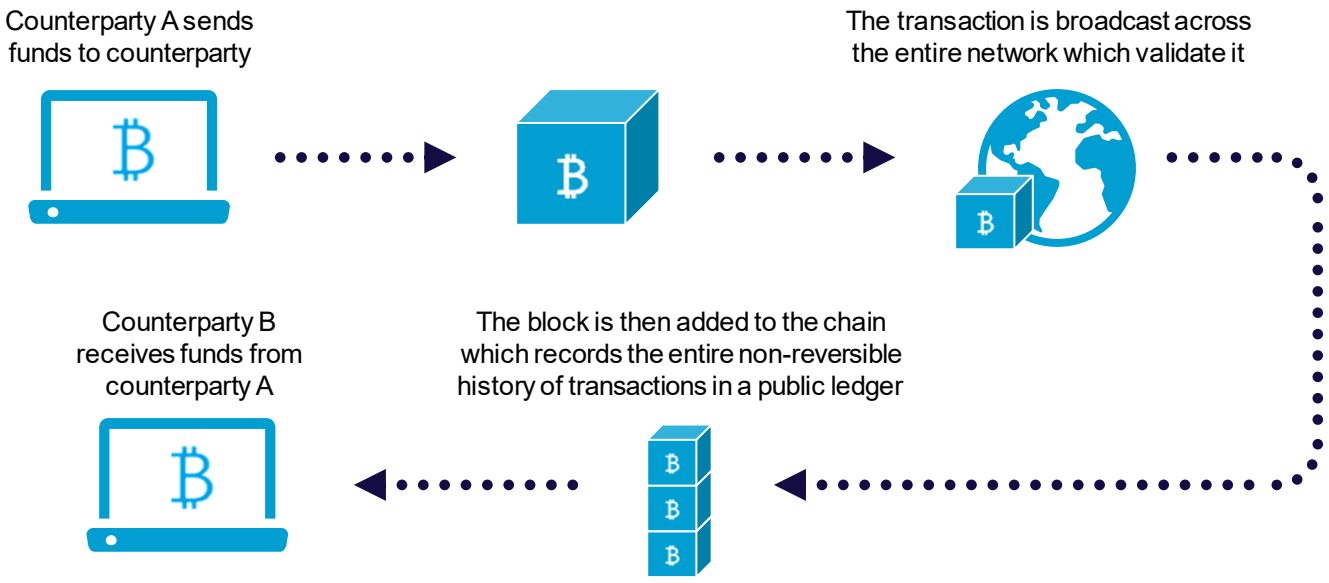
- The agri-food supply chain is complex, with efficiency, accuracy, transparency & food integrity key challenges to optimal information management.
- Blockchain is a highly promising technology, with potential to address these challenges.
- A digital ledger, the blockchain system is not reliant on intermediaries. Transactions are stored as blocks, which cannot be changed or reversed, reducing corruption.
- The tech has ability to track a product from its origin and process it through the entire supply chain, important to modern consumers concerned with fair trade and nutrition.
- A recent product test via blockchain took 2.2 seconds to locate farm of origin, a process that previously took 18.5 hours.

Every block is unique to a specific transaction which cannot be altered, changed or reversed. This reduces the chances of corruption, meaning every transaction made is highly encrypted. The problem solved by blockchain is one of building a consensus foundation for secure information without worrying about data tampering by any member who cannot be trusted by the whole network. This emerging technology also has the ability to track a product from its origin and process it through the entire supply chain.

Companies from many industries are investing in pilot projects of blockchain technology, and food companies are no exception to this. Coffee giant Starbucks recently embarked upon a project called "Bean to Cup"; a tracking system for consumers who want to know exactly where their coffee comes from. Another pilot study carried out in South Africa attempts to trace the journey of table grapes from their origin to European consumers..

By using blockchain technology, they could provide all the information to customers within 2.2 seconds. What's more, the technology could also help farmers who are obliged to trust the marketing teams responsible for promoting their products. It could give them a better insight into their own commodity. Implementing blockchain technology could result in an "Uberization" of the agri-food value chain; bypassing middlemen and reducing transaction fees.

Figure: Visual presentation of how blockchain ledger works



> "The epicure of the future will manufacture their food rather than rely on natural growth.

Why blockchain could be good for agri-food business

The length and complexity of the modern food supply chain has created distance between the consumer and producer, making it difficult for producers to directly address the consumer and their concerns around food. In the current system, most of the data and information is audited and handled by a third party and stored on paper or in a centralised database, which creates more room for food fraud. In 2017, Walmart carried out traceability tests on mangos and found that it took six days, 18 hours and 26 minutes to track it back to its original farm.

Shortcomings of blockchain technology

Just like other disruptive technologies, blockchain has some shortcomings and socio-economic challenges. These include determining how to link physical flows to information flows and how to handle a high number of transactions in a single system. Some argue that the technology is still in its infancy, but business applications and proofs of concept are fast emerging. Another argument notes that while it does foster transparency, it sacrifices confidentiality in the system, which in some cases is a risk.

> We shall escape the absurdity of growing a whole chicken in order to eat the breast or wing, by growing these parts separately under a suitable medium.

Conclusion

Blockchain technology is still looming. Knowing the reliability that digitisation brings, and the demand for data and food integrity, there is certainly scope for exploring this technology. It could prove helpful for value chain partners in making systems more transparent, business transactions and compliance processes more efficient, and reduce complex traceability operations. For NGOs, it could prove effective for investors to support inclusive business models.

Benefits notwithstanding, the question still remains: Would this new technology be superior to existing IT solutions? Whatever the consensus, it's clear that overlooking blockchain technology due to a lack of understanding could result in a waste of resources and missed opportunities for businesses and society as a whole.

Expert in this Insight

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