

Improving Food Safety & Traceability through blockchain

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What is blockchain technology?

In basic terms, a **blockchain** is a **digital distributed ledger**, maintained by a **network of multiple computing machines**. It **stores data** in the form of **blocks** that are **cryptographically secured** and **immutable**. The **blockchain** is the brainchild of a person or group of people known by the pseudonym, **Satoshi Nakamoto**. It was **first reported** in **2008** and since then, has become very popular. Unique features of blockchain:

- **Decentralized**

Unlike the current internet system, there is no single server where entire information is stored. These **data** are **saved** as copies in different computers (called **nodes** in the blockchain world) and there is no central authority supervising anything. These computers are connected to the **blockchain network**. Due to this distributed copies of data (transaction), blockchain is also known as a **distributed ledger**.

- **Trustless**

Blockchain provides such a **transparent environment** that one need not to have a **third-party** to **mediate** or **enhance trust** between **two parties** involved in transaction.

- **Transparent**

This should not be **misinterpreted** as **violating privacy**. The **identity** of **parties** involved in a transaction is **hidden** via **complex cryptography** and **represented** only by their **public address (code)**. While the **identity** is **secure**, all the **transactions** that are carried out by **public address** are **accessible**. This level of **transparency** enhances **trust** in the system while **securing privacy**.

- **Immutability**

Any **data** entered in **blockchain** cannot be **modified/tampered** with in the **future**. This **immutability** feature of **blockchain** has **made** it so **popular** that it is being explored in **all the sectors** where **data integrity** and **data protection** is of utmost importance.

What is blockchain technology? cont.

Public Blockchain is a permissionless blockchain.

Anyone can join the blockchain network, meaning that they can read, write, or participate with a public blockchain. Public blockchains are decentralised, no one has control over the network, and they are secure in that the data can't be changed once validated on the blockchain.

Private Blockchain is a permissioned blockchain.

Permissioned networks place restrictions on who is allowed to participate in the network and in what transactions.

		Ethereum Bitcoin	
Public & Closed	Public & Open		
<ul style="list-style-type: none">• Voting• Voting records• Whistleblower	<ul style="list-style-type: none">• Currencies• Betting• Video Games		
Private & Closed	Private & Open		
<ul style="list-style-type: none">• Construction• National Defence• Law enforcement• Military• Tax Returns	<ul style="list-style-type: none">• Supply Chain• Government financial records• Corporate earning statements		
		Hyperledger R3 Corda	

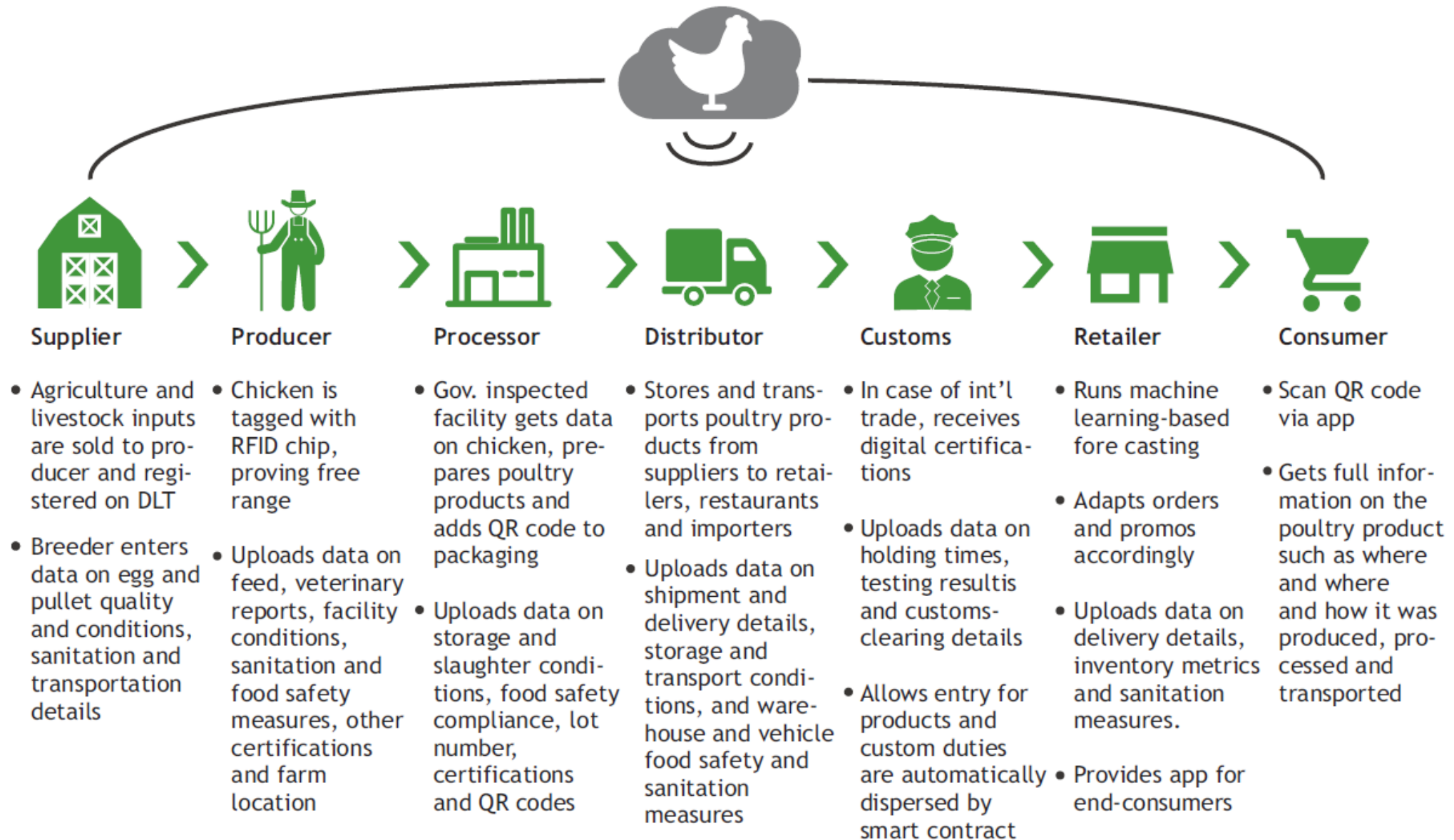
Blockchain in Supply Chain & Food Industry

Blockchain technology in Supply Chain

Blockchain is a public, distributed and decentralized ledger, where information is encrypted and stored in a tamper-proof and secure way. Once data is entered into the system and validated, it becomes unalterable. Thanks to IoT (Internet of Things) devices it is possible to implement traceability that covers each phase of the supply chain including production, logistics and distribution.



Agricultural supply chain on Blockchain DLT



Themes in Blockchain in the Consumer Industry

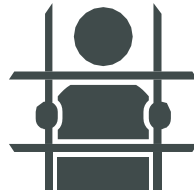


Traceability and Visibility across the value chain

Increasing speed & flexibility
of supply chain drives
demand for real time
tracking across partners

Examples:

- Product recalls
- Manufacturing collaboration
- Government compliance

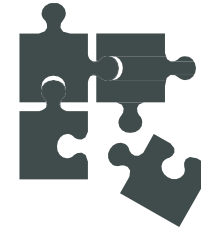


Fraud & Provenance Transparency

Customers and
watchdogs want to know
where goods come from.
Safety is key. Fraud and
Counterfeit cost and
reputation

Examples:

- Food & Product safety
- Organic food verification
- Authenticity



Redundant & Incomplete Data

Existing data systems are
based on messages
between silos, with different
organizations having
different or incomplete
data

Examples:

- Order management



High Friction Enterprise Integration

Transactions volume and
speed of the business
lead to a highly disputed
environment and eroding
trust and exposing cash

Examples:

- Dispute Resolution
- Trade promotions
- Order fulfillment

Blockchain Platforms for Supply Chain & Food Industry

- Food Trust and Watson platforms by **IBM**,
- Track & Trace, and Leonardo platforms by **SAP**,
- Track & Trace, and Internet of Things solutions by **ORACLE**,
- Supply Chain Track and Trace Azure platform by **Microsoft**.
- Provenance platform (<https://www.provenance.org/>) - UK **PROVENANCE**
- Te-food Solution (<https://te-food.com/solution/>) - Germany **TE-FOOD**
- Foodchain platform (<https://food-chain.it/>) - Italy **Foodchain**
- VeChain Blockchain Food Safety solution powered by VeChain
ToolChain™ (<https://www.vechain.com/>)

Blockchain in Food Industry Use Cases

Walmart & IBM are envisioning a fully transparent 21st century digitized food system



In case of a food safety issue, how to do traceability in minutes/ seconds instead of weeks ?

Walmart & IBM are envisioning a fully transparent 21st century digitized food system



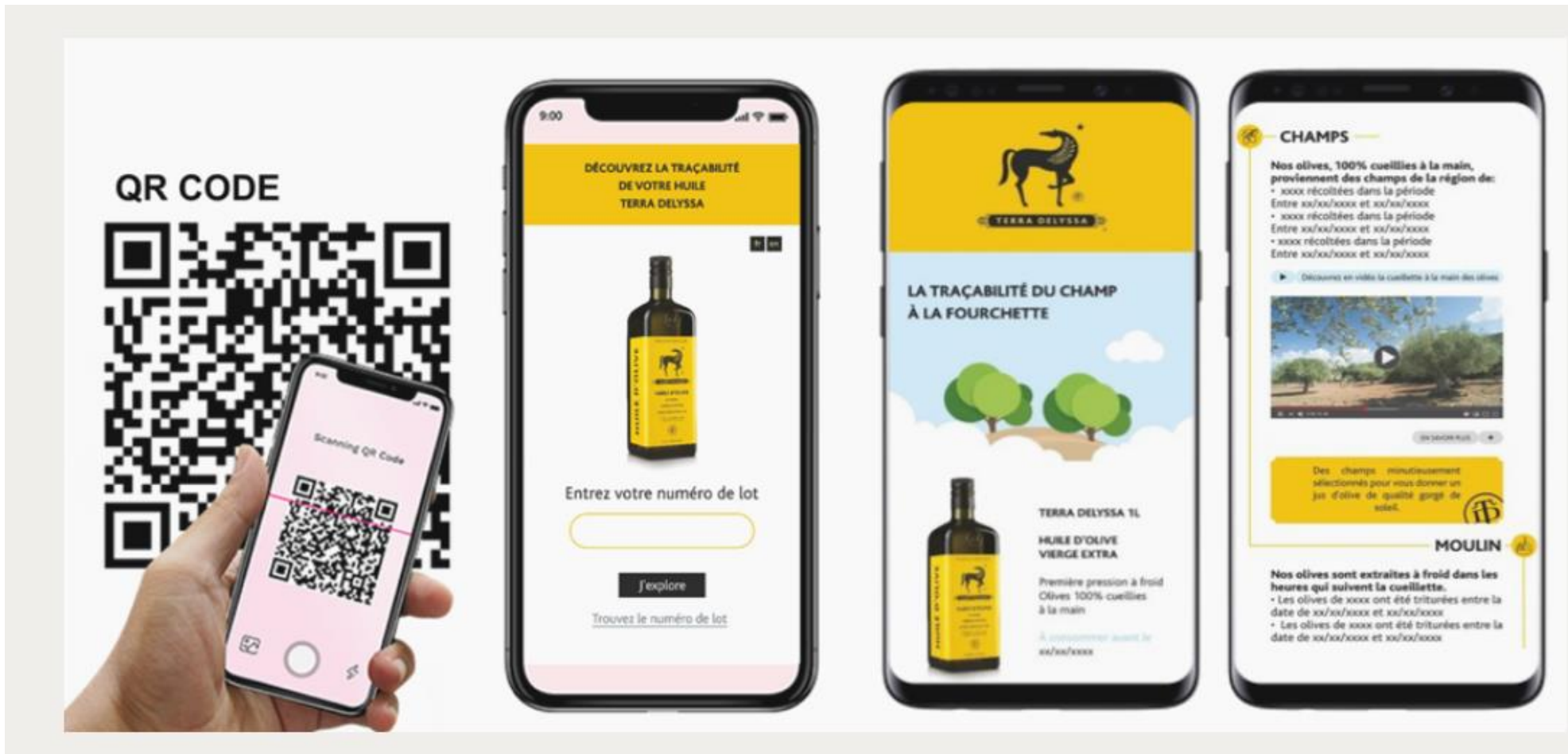
Walmart 

<https://youtu.be/SV0KXBxSoio>

“Creating a (traceability) system for the entire food supply ecosystem has been a challenge for years, and no one had figured it out. We thought that blockchain technology might be a good fit for this problem, because of its focus on trust, immutability, and transparency.”

Karl Bedwell, Senior Director at Walmart Technology

Terra Delyssa & IBM provide full traceability of Extra Virgin Olive Oil



Terra Delyssa & IBM provide full traceability of Extra Virgin Olive Oil



Blockchain projects in Food Industry

Below, we have compiled several examples from different food industries where blockchain has been or is planning to be used in pilot-scale:

- **The Sustainable Shrimp Partnership (SSP)** has collaborated with **IBM** to use its **Food Trust** ecosystem to provide complete traceability of **SSP shrimp** for their consumers.
- **Nestlé** collaborated with **OpenSc**, a blockchain platform, to trace milk from farms and producers in **New Zealand** to **Nestlé factories** and **warehouses** in the **Middle East**. Interestingly, in 2017, **Nestlé** introduced blockchain technology in the **IBM Food Trust** platform and gave access to its consumers the data related to **Mousline purée** in **France**.
- **Nestlé** and **Carrefour** collaborated to use **IBM Food Trust** platform for their **GUIGOZ Bio 2 and 3** infant milk range (from **Laboratoires Guigoz**).
- **Cermaq salmon** and **Labeyrie** came together to utilise the **IBM Food Trust** platform to ensure **traceability** and **transparency** in their **supply chain**. **Labeyrie**, a leading brand of **smoked salmon** in **France**, is using blockchain technology for two of its **Norwegian smoked salmon** products.
- **El Ordeño**, one of the **milk processors** from **Ecuador**, adopted **IBM Food Trust** to bring **transparency** and **reduce food waste**. Through the **QR code** present in its **TRU milk products**.
- **Organo corporations** is implementing **IBM Food Trust**, to selectively share key information about **Organo products** with **consumers, supply partners, commerce partners, distribution partners, etc.**
- The **Malaysian Palm Oil Council (MPOC)** has collaborated with **BloomBloc** to implement blockchain technology to enhance **accountability** and **traceability**.

In a nutshell, Blockchain can be a game changer...



Saves time

Transaction
time from
days to near
instantaneous

Removes cost

Overheads and
cost
intermediaries

Reduces risk

Tampering,
fraud &
cyber crime

Increases trust

Through shared
processes and
recordkeeping



Contact Details

- Web Site: <http://blockchain.org.gr/>
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- Facebook page: <https://www.facebook.com/hellenicblockchainhub/>
- Medium blog: <https://medium.com/hellenic-blockchain-hub-el>
- LinkedIn group: <https://www.linkedin.com/company/hellenic-blockchain-hub/>

Thank You

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