Programming Black Formative Website Notes

# Blockchain Technology

Examining impact of blockchain tech in agriculture and food supplies

Every transaction is disseminated through a network of machines running the blockchain proptocol, and need to be validated.

## Food supply chain

Food supply chain worldwide is highly multi-actor based and distributed, with numerous different actors involved, such as farmers, shipping companies, wholesalers and retailers, disributors, and groceries. Main phases characterizing a generic agri-food supply chain are described below:

1. *Production:* Represents all agricultural activities implemented within the farm. Farmer uses raw and organic material to grow crops and livestock.
2. *Processing:* the transformation, total or partial, of a primary product in to one or more secondary products. Each package might be uniquely identified through a production batch code containing info such as the production day and raw materials used
3. Timeline

   Description automatically generated*Distribution:* product is released for distribution

## Blockchain in agriculture and food supply chain

Various organisations aim to harness the transparency and fault tolerance in order to solve problems in scenarios where numerous untrusted actors get involved in distribution of some resource.

Agriculture and food supply chains are well interlinked, since products of agriculture almost always are used as inputs in some multi-actor distributed supply chain, where consumer is final client

Blockchain applications started to become used in supply chain management soon after it appeared

Blockchain in supply chain management expected to grow at 87% and increase from $45 million in 2018 to $3314.6 million in 2023

December 2016 AgriDigital executed first settlement of 23.46 tons of grain on a blockchain.

Over 1300 users and more than 1.6 million tons of grain have been transacted over cloud-based system.

Avoiding duplication and manual checks, document processing was reduced to a fifth of the time

**Food safety**

e.g. ZetoChain perform environmental monitoring at every link of the cold chain, based on IoT devices. Problems are identified in real-time and parties involved are notified for fast action taking.

Smart contracts are harnessed to increase safety of sales and delivery of goods

**Food integrity**

Agriculture conglomerate Cargill Inc. aim to harness blockchain to let shoppers trace their turkeys form store to farm

Graphical user interface, text, application, email

Description automatically generatedExample of how it could be implemented

People who bring plastic rubbish ito bank recycling centres are rewarded via blockchain-secured digital tokens

# Drone Farming

Reduces labour costs and reduces number of resources required to grow crops, and minimizes waste generated. Drones can test the irrigation level, e.g. using cameras to decide if portions of fields require more or less water and fertilizer.

Drones assist in making farming more efficient by equipping farmers with precise data regarding amount of a chemical needed on a field for pest management or to promote crop growth