



Blockchain technology for value chains: introduction

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Presenters **SIM Supply chain:**

Leontien Hasselman-Plugge, CEO

Irene Beers, Head Knowledge Center

Nithya Suri Narayan, Consultant

Objectives of this presentation

1. Introduce blockchain technology, how it is applied and how it can benefit agro-food supply chains
2. Share with you our experience with the pilot project we did this year to assess the readiness for blockchain of the cocoa value chain in Ghana

Contents

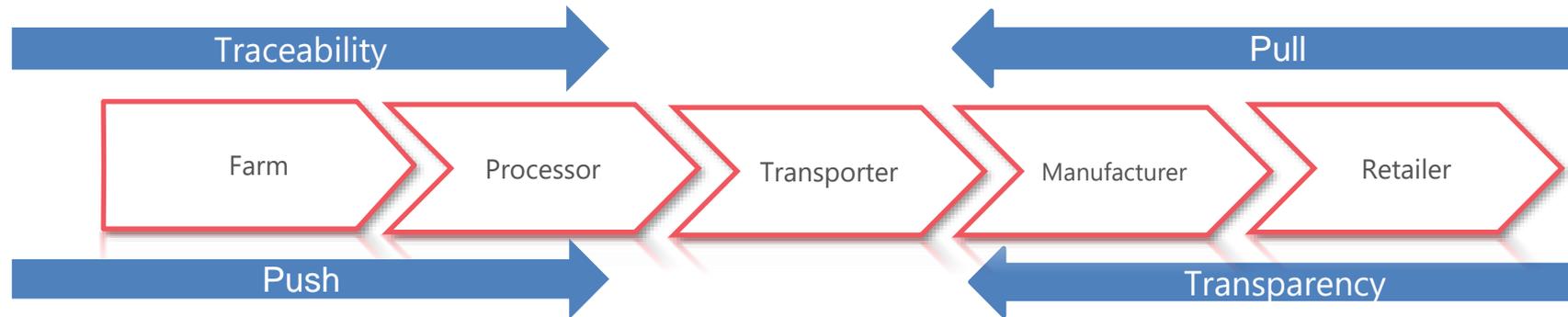
1. What is blockchain?
2. Blockchain, transparency and traceability
3. Common issues in supply chains that blockchain can address
4. Examples of blockchain application
5. UNIDO Methodology to assess the readiness of a VC to adopt blockchain
6. Pilot application of the methodology in the Ghana cocoa value chain
7. Possibility of applying the methodology in Peru

Poll 1 – Getting to know you

1. Where is your organization located within this value chain?

- Farmer/cooperative
- Warehouse
- Processor
- Collectors
- Transporter
- Exporter
- Retailer
- Quality service provider and/or Labs
- Certification
- Verification
- Other

2. Blockchain, transparency and traceability



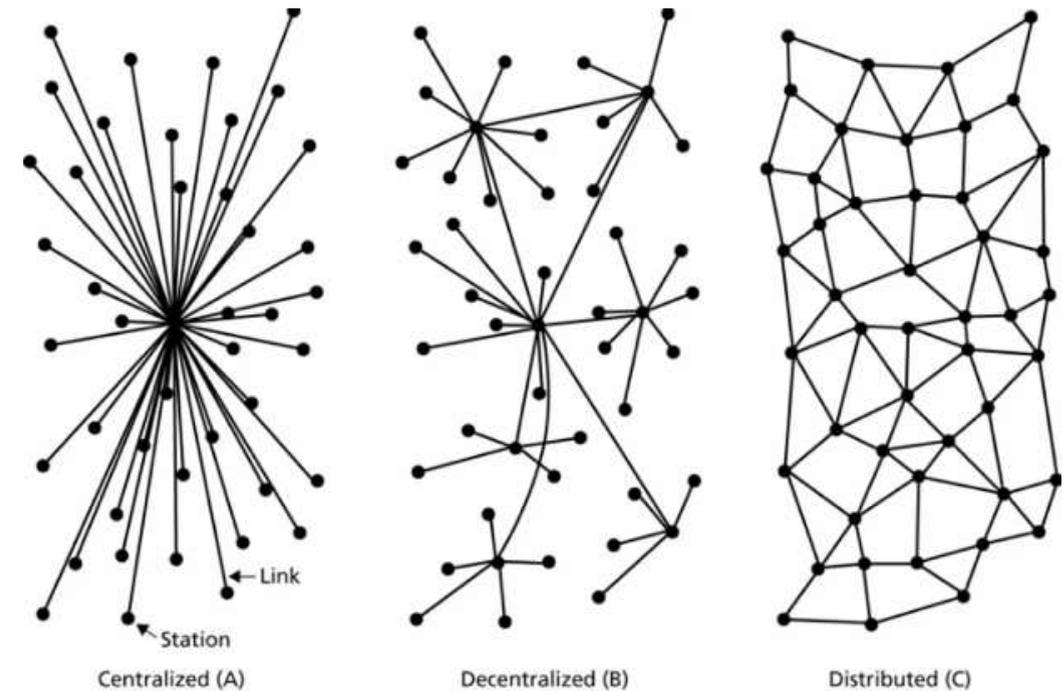
Data on:

- Safety
- Sustainability
- Efficiency
- Quality
- Provenance
- Financial transactions



1. What is blockchain?

- Distributed ledger
- Democratized
- Immutable
- Privacy guaranteed
- Encryption of data



The blockchain at work



Confirm
& Add Data



Confirm
& Add Data



Confirm
& Add Data



Confirm
& Close

Facility passport

All actors have a facility passport

Decentralized and democratized data management, quality information, provenance, food safety and social compliance validated on location level. Harmonization of the data points across the various participants



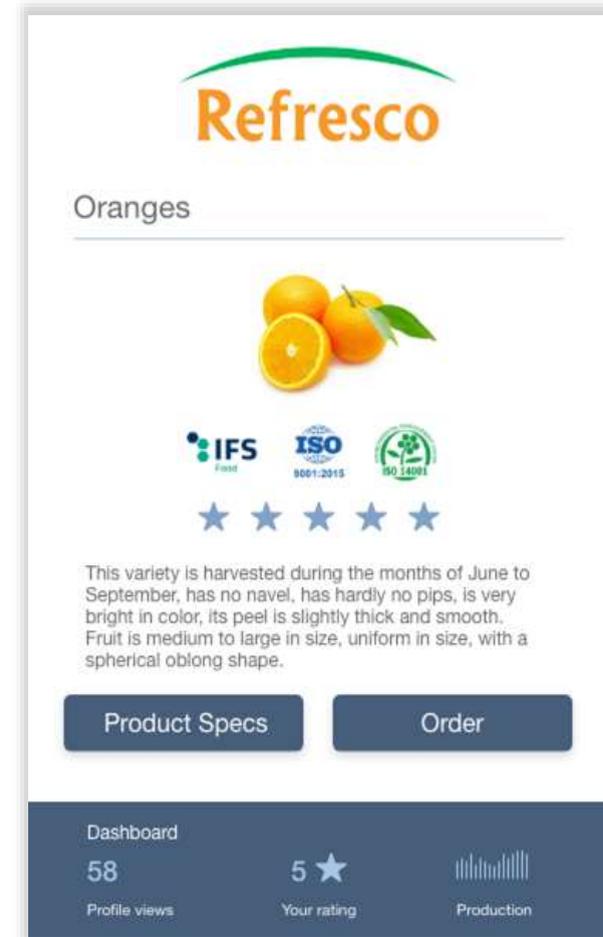
Julio
Team Manager
Quality Inspections

From now on Forward Looking
Historical Available Data,
Graphs and Statistics

Product passport

All batches have a product passport

Full traceability and auditability of activities and transactions between all organisations. Building a trusted record of historical data including user specifics and product specifications.



Refresco

Oranges



IFS **ISO** **ISO 14001**

★★★★★

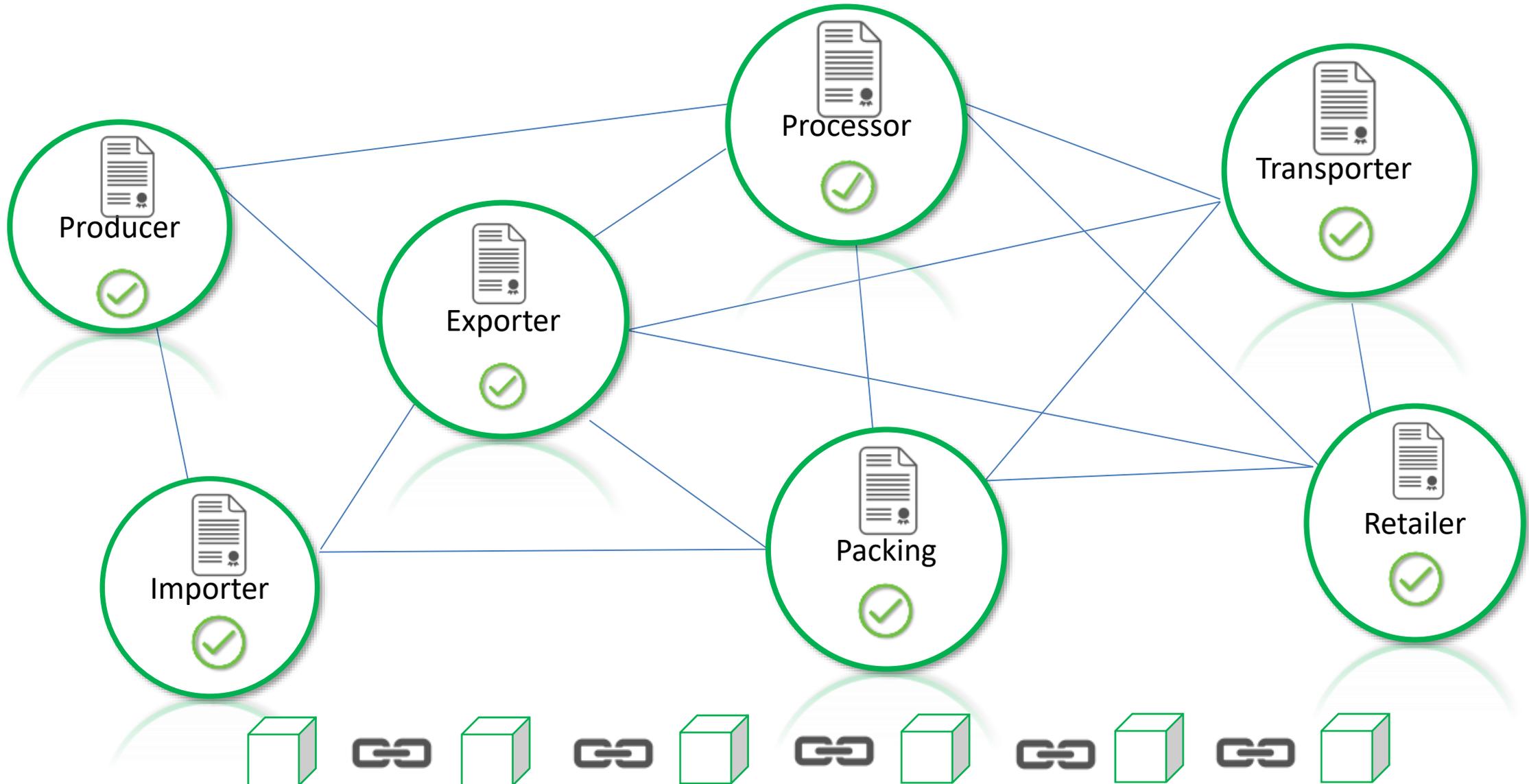
This variety is harvested during the months of June to September, has no navel, has hardly no pips, is very bright in color, its peel is slightly thick and smooth. Fruit is medium to large in size, uniform in size, with a spherical oblong shape.

[Product Specs](#) [Order](#)

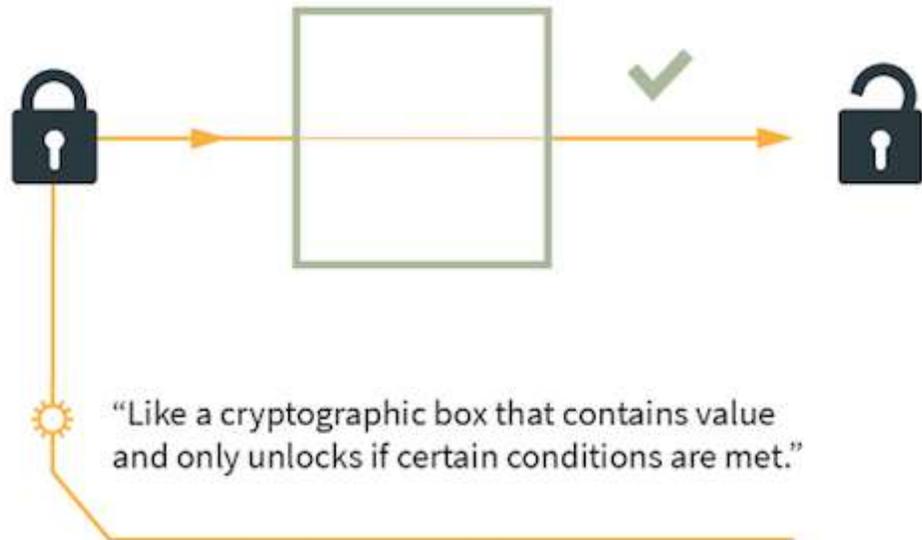
Dashboard

58 **5** ★ 

Profile views Your rating Production



Smart Contracts



- Smart contracts are a set of business rules written in code onto the blockchain.
- Self-enforcing and self-executing at every step in the supply chain
- Help automate and govern food production processes efficiently
- Provide more speed, accuracy, digitization and security than traditional business governance processes
- Can cut costs in virtually every step of the supply chain
- Authorizations whom to share which data with

Private permissioned blockchain



All selected data
sent to
private
confidential
blockchain



Selected public
data
retrieved from
private
confidential
blockchain



3. Common issues in supply chains that blockchain can address:



Disconnected supply chain, demand and supply

No product traceability and product provenance

No inclusiveness for farmer and growers

Tracking critical parameters - social and environmental

Supplier contract management, fulfilment and payment

Centralized power

Food fraud, false origins

Inefficiencies with food waste and food recalls

Poll 2 - Problems that blockchain can address

- 1. What is the time it takes your clients to pay you after you have delivered their order?**
 - Up to 1 week
 - 2 weeks to 1 month
 - Longer than 1 month
- 2. Do you know where your product ends up: in what markets, in what end-products/consumers?**
 - Yes, I know exactly what end-products/consumers, and countries of destination
 - I have some idea of what end-products/consumers and countries of destination
 - No, I do not know where my product goes
- 3. If you produce certified product, for instance organic, can you sell it for a higher price?**
 - Yes
 - No
 - Not always

4. Examples of blockchain: orange juice from Brazil



Enter L# = 1748815

Quality
Social compliance



4. Examples of blockchain: tilapia from Indonesia

Voer de product code in

E079190 A079190

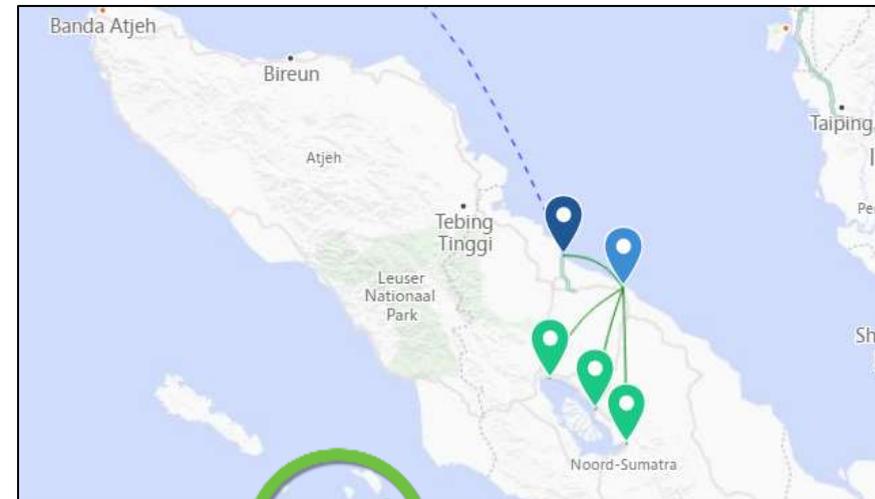
BATCH GEGEVENS OPHALEN Batch voorbeeld

Waar vind ik deze code?

Fill in the product code on the package of your product

<https://www.jumbo.com/inspiratie/tilapia>

Enter: E079190 A079190 (frozen tilapia)



Food safety/antibiotics
Environmental protection
Social compliance



4. Examples of blockchain: bananas from Colombia



Enter # = 12345

De reis van FLO-ID 12345

Plantage El Antojo 👍 40

Locatie: Comunal Churidó - Apartadó - Antioquia

Welkom bij plantage El Antojo! Deze plantage ligt in Churidó - Apartadó in Colombia. De plantage respecteert natuurlijke hulpbronnen zoals dijken die worden onderhouden om overstromingen te voorkomen en in de luwte te kunnen telen. De afgelopen jaren is er hard gewerkt aan herbebossing en bescherming van planten en dieren. Naast een uitgebreide opleiding van eigen medewerkers wordt ook het onderwijs in de regio ondersteund.

👍 Like deze bananenplantage

Voetbalvelden (1 = 7140 m2)	236
Aantal medewerkers	119
Bananenopbrengst per jaar	335.898 dozen à 18 kilo
Fairtrade certificering	Sinds 2007
CO2 voeldruk van deze reis**	436 gram per kilo bananen

** is een rchatting van een gemiddelde



Fairtrade
Climate neutral

4. Examples of blockchain: mango pilot Walmart/IBM

Pilot Test Case

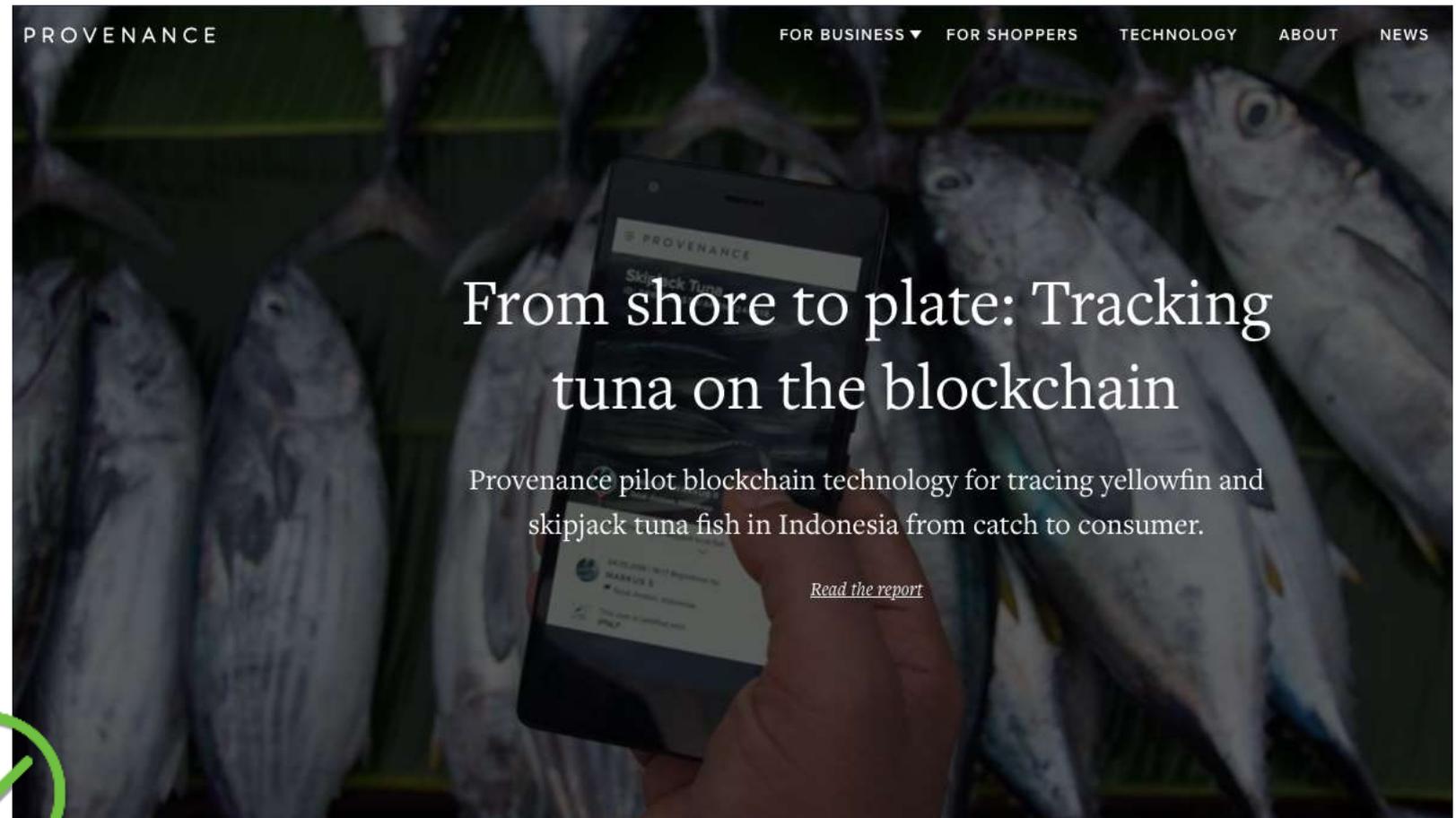
How long does it take to trace a package of sliced mangoes back to the farm?



Traceability in global trade



4. Examples of blockchain: tuna from South-East Asia



**Social compliance (slavery)
Legal fishing/fraud**



5. UNIDO Methodology to assess the readiness of a VC to adopt blockchain

- Blockchain is not an end in itself, is a means - to optimize:

Trust

Trace

Track

Tamper

Transparency

Tran\$fers

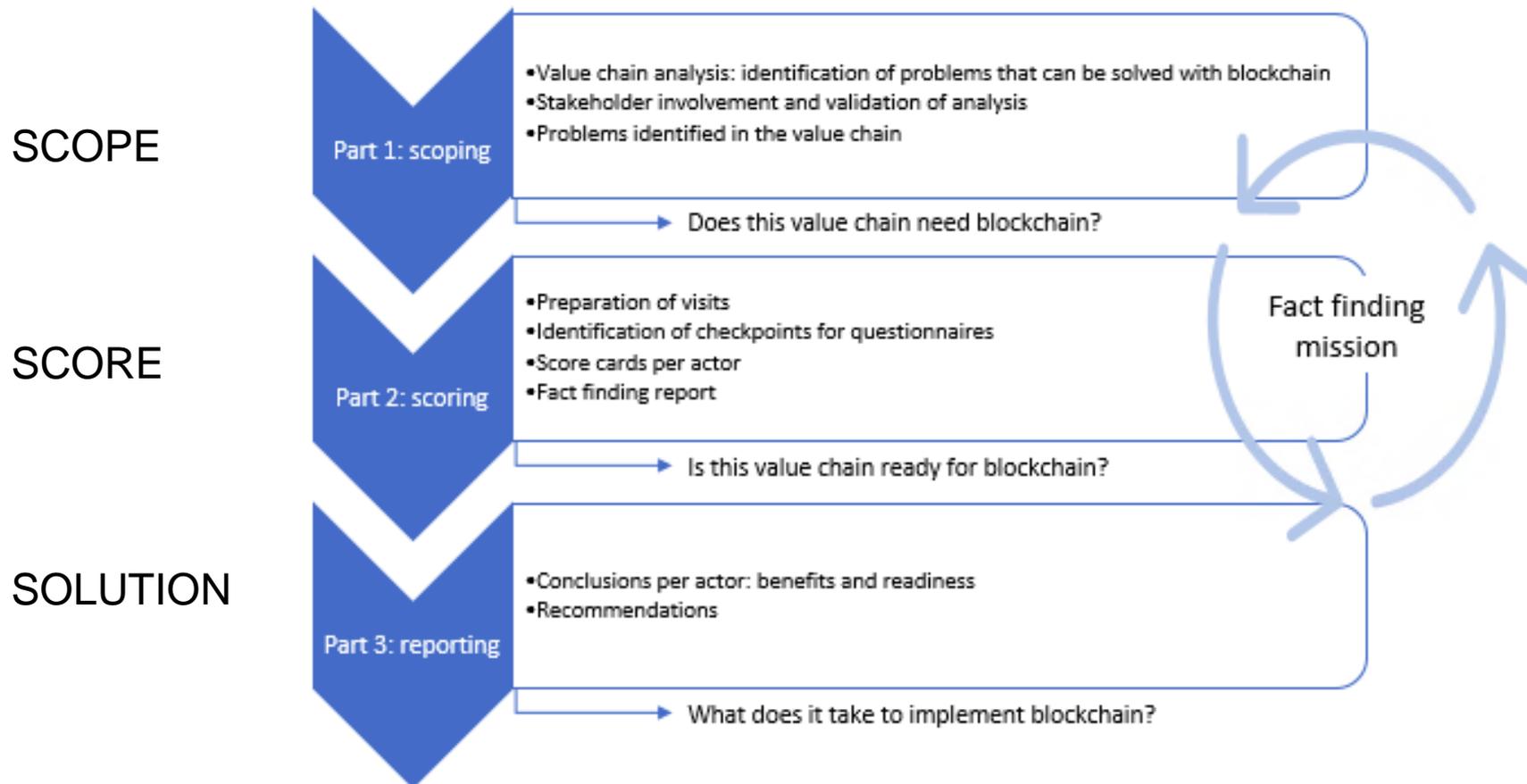
Trade

Etc

5. UNIDO Methodology to assess the readiness of a VC to adopt blockchain

- The UNIDO tool aims to answer three key questions:
 1. Does my industry need blockchain?
 2. Is my industry ready to adopt Blockchain?
 3. What does it take to implement Blockchain?

5. UNIDO Methodology to assess the readiness of a VC to adopt blockchain



5. UNIDO Methodology to assess the readiness of a VC to adopt blockchain

- Mapping of the chain and supply chain ‘actors’: who is involved in making the product



- Understand their role, how they are organized and how do they communicate, what are their challenges?
- Who are the 3rd parties involved to support and regulate the supply chain: legislators, quality assurance, sector organizations, trade unions, NGO's, ...

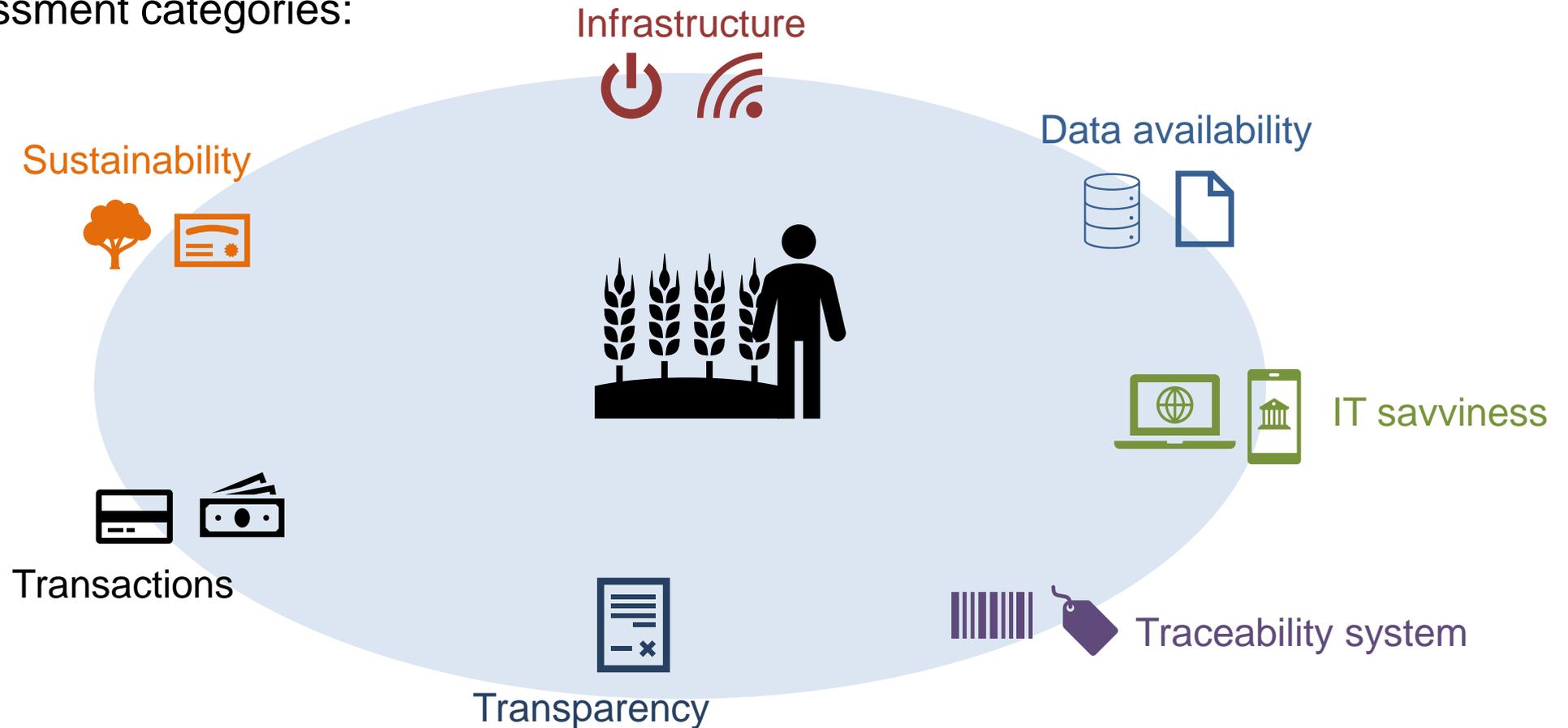
5. UNIDO Methodology to assess the readiness of a VC to adopt blockchain

- Stakeholder identification:
 - Key stakeholders
 - Soundboard
 - Public communication
- Start building the basis for the ‘ecosystem’ with the potential project partners
- Explore ‘**what’s in it for me**’ and what are the business problems

Influence / Interest		Influence	
		High	Average
Interest	High	1 Key stakeholders: actively involve during whole process	3 Soundboard: information & consultation on planned moments
	Average	2 Soundboard: information & consultation on planned moments	4 Monitor & inform about results
	Low		

5. UNIDO Methodology to assess the readiness of a VC to adopt blockchain

- Assessment categories:



5. UNIDO Methodology to assess the readiness of a VC to adopt blockchain

- Score cards per actor:

Infrastructure	✓	✓		✓	✓	✓
Data availability	✓	✓	✓		✓	
IT savviness		✓		✓		✓
Traceability system	✓				✓	✓
Transactions			✓		✓	
Transparency		✓				
Sustainability	✓					✓

6. Pilot application of the methodology in the Ghana cocoa value chain

Approach:

- Involved main players in the Ghana from the start
- Involved an export market retailer and a buyer/processor from the start
- Validated the value chain mapping and identified issues with all stakeholders along the way
- Planned the factfinding to include all actors in at least 1 supply chain, preferably conventional and certified product
- Prepared questionnaires based on the assessment categories (data availability, transactions, IT savviness, traceability, sustainability, infrastructure, transparency) and the research

6. Pilot application of the methodology in the Ghana cocoa value chain

Fact finding:

- 6 cocoa farmers (2 large farms, 4 smallholders)
- 1 cooperative
- 1 purchasing clerk/trading station and 2 licensed buying companies
- Warehouse CMC (Cocoa Marketing Company) at port
- Quality Control Company (QCC) at port
- Regulatory and supporting organisations: COCOBOD, CRIG, CHED

6. Pilot application of the methodology in the Ghana cocoa value chain

General findings:

1. Does the value chain need blockchain?
 - a) Broad range of sustainability risks (economic, social and environmental)
 - b) Inefficiencies in inventory management, quality verifications and payments/pre-financing

2. Is the value chain ready for blockchain?
 - a) Data is still paper-based (most production is done by smallholders in remote areas), cash payments
 - b) New digital traceability system throughout the sector -> important opportunity to implement blockchain

3. What does it take to implement blockchain?
 - a) Digitization and extension of the traceability system
 - b) Getting the first mile involved (farmers & purchasing clerks)

6. Pilot application of the methodology in the Ghana cocoa value chain

Lessons learned for next blockchain readiness assessment:

- Understanding the role of governments and institutions in a country is essential
- A fact finding mission of five days is sufficient time to provide initial and general insights, as long as a representative group of supply chain actors can be visited
- Involvement of downstream stakeholders (export market buyers/retailers) is crucial also in this early phase
- Identifying the (operational) problems as experienced by the different upstream actors has to be a main focus for the fact finding mission
- It is important during a fact finding mission to look for general trends within the country towards digitalization

7. Possibility of applying the methodology in Peru

Steps to take:

- Scoping: what commodity value chain should the readiness assessment focus on?
- Identify the stakeholders in Peru and in the export market
- Start value chain mapping and communications with stakeholders
- Plan fact finding (visit or remote assessments)
- Total duration of project: 2-3 months (depending on time needed for stakeholder involvement)

7. Results of the poll: what problems can blockchain address?

Poll 3 - Interest of participants

1. Would you be interested in having your organization assessed for Blockchain readiness?

- Yes
- No

