



# Blockchain for transparent & sustainable supply chains

Application to the garment industry  
GIZ Blockchain Lab, Joséphine Quioc



## 16.11 - Parallele Workshop

1. What is blockchain?
2. Blockchain & supply chains
3. Blockchain for the garment industry

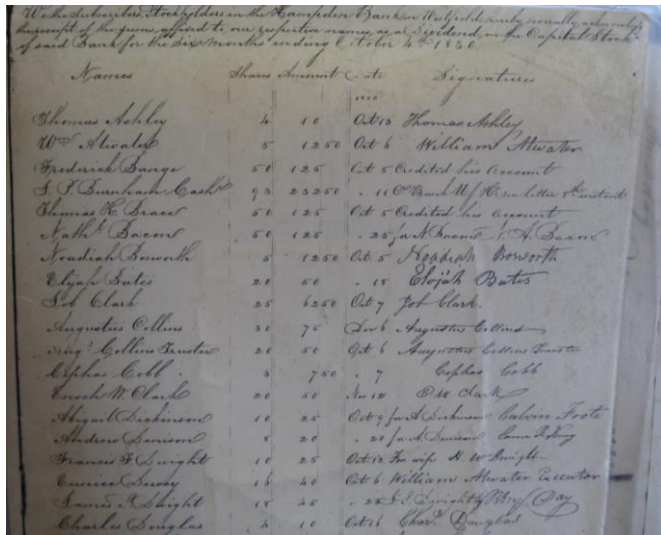


# 1. What is blockchain?



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- a « Digital Ledger »



**Transactions** ☆

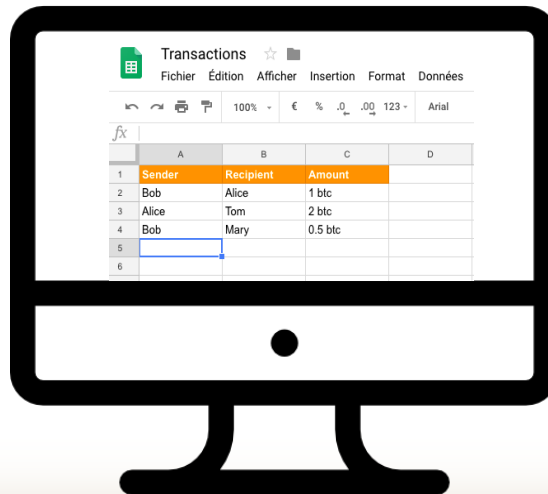
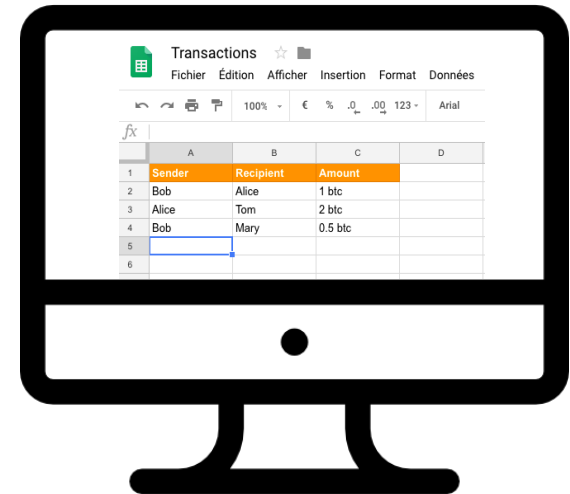
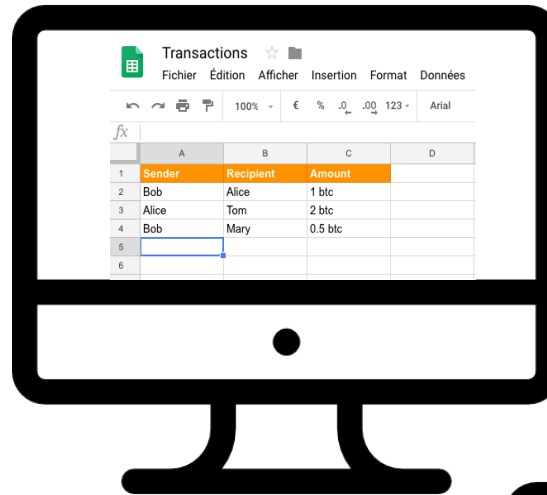
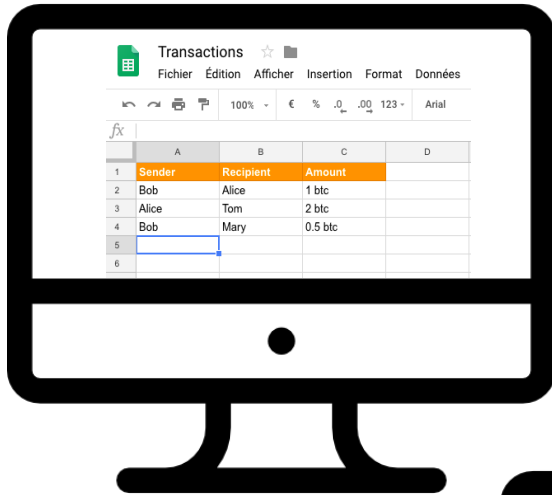
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	A	B	C	D
1	<b>Sender</b>	<b>Recipient</b>	<b>Amount</b>	
2	Bob	Alice	1 btc	
3	Alice	Tom	2 btc	
4	Bob	Mary	0.5 btc	
5				
6				



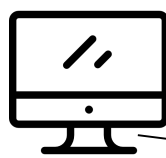
# 1. What is blockchain?



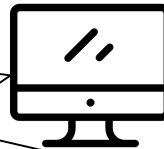


## 1. What is blockchain?

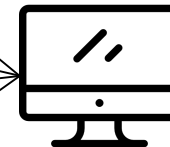
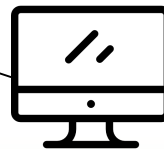
Sender	Recipient	Amount	Stage
Bob	Alice	1 btc	Validated
Alice	Tom	2 btc	Validated
Bob	Mary	0.5 btc	Validated
Alice	Mary	3 btc	Being processed



1. Alice creates a transaction

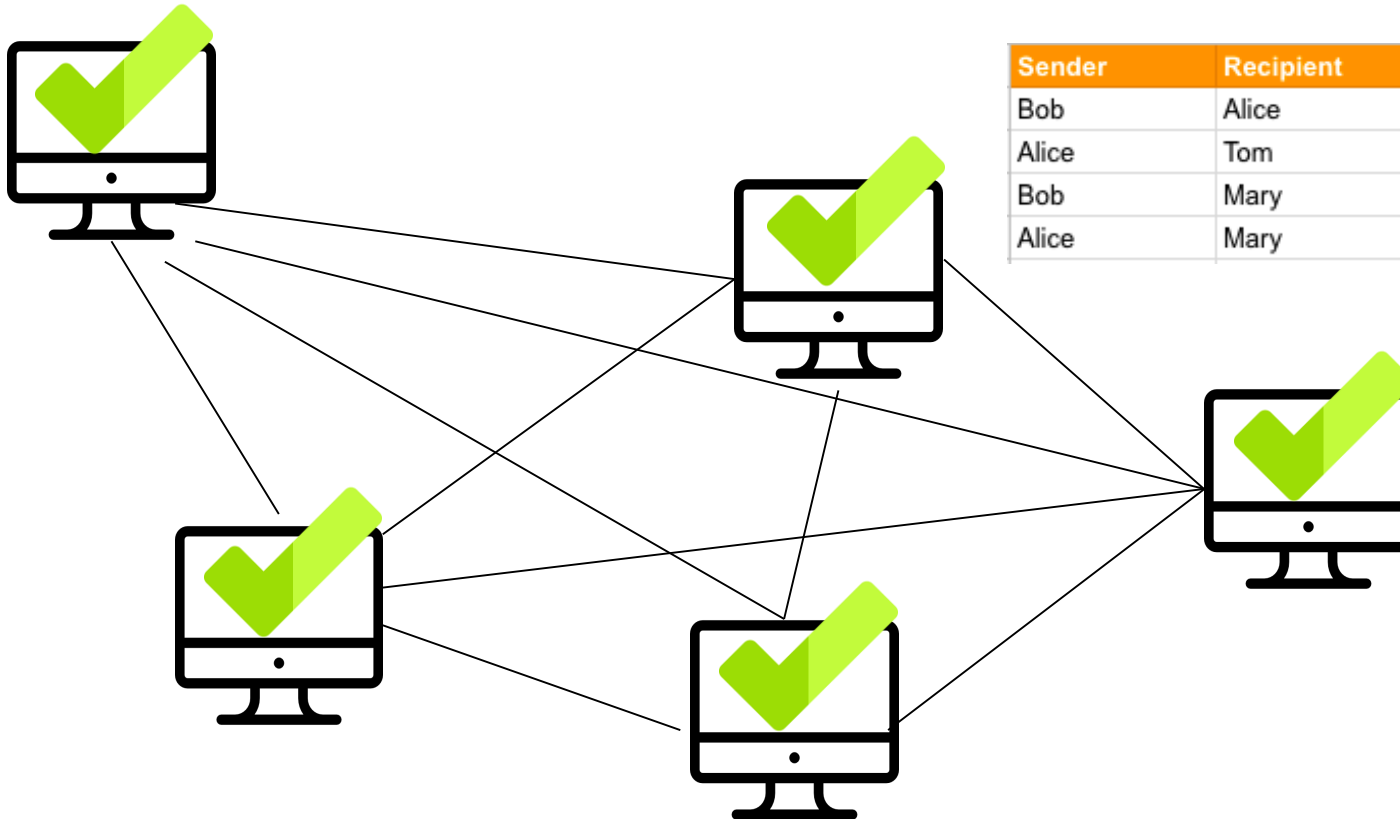


2. Transaction has to be validated by all the agents (nodes in the network)





## 1. What is blockchain?



Sender	Recipient	Amount	Stage
Bob	Alice	1 btc	Validated
Alice	Tom	2 btc	Validated
Bob	Mary	0.5 btc	Validated
Alice	Mary	3 btc	Validated



## 1. What is blockchain?

Action does not always have to be commanded on a blockchain: it can be autonomously triggered:

- Smart contracts are pieces of codes in which actions are written as a chain of events
- Like a domino effect, the smart contract executes action 2 as soon as action 1 is fulfilled

Application:

- Payment sent to car rental (1) → Smart contract opens the car's lock (2)
- Flight cancelled (1) → Smart contract triggers insurance payment (2)





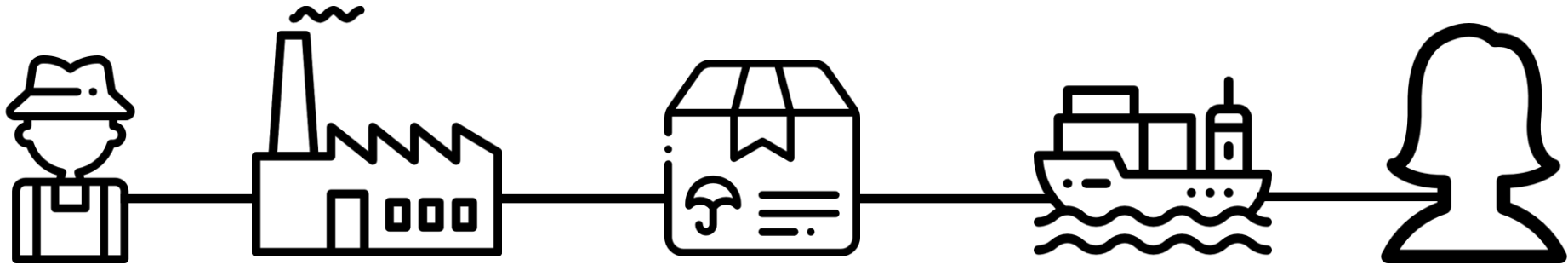
## 2. Blockchain & supply chains



## 2. Blockchain & supply chains // Usual supply chain problems

- Data fragmentation
- High transaction cost
- Poor information sharing

→ Where is my shipment? Where was it produced? Under which conditions?



Price asymmetry  
between small  
producer and buyer

Costs/inefficiency for  
sellers, transformers  
and transporters

No visibility on  
production/sourcing  
methods



## 2. Blockchain & supply chains // the features of blockchain - a perfect enabler?

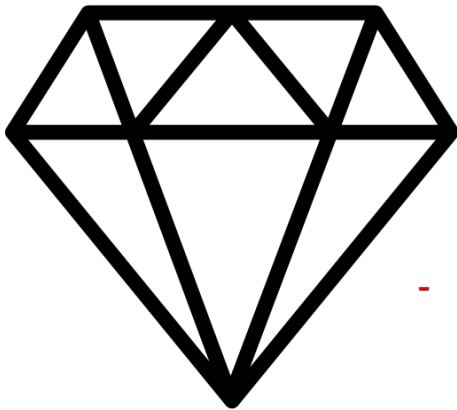
- Because blockchains are globally distributed IT-systems which allow the traceability of transactions...
- They offer a new level of integrity, security, participation, and transparency



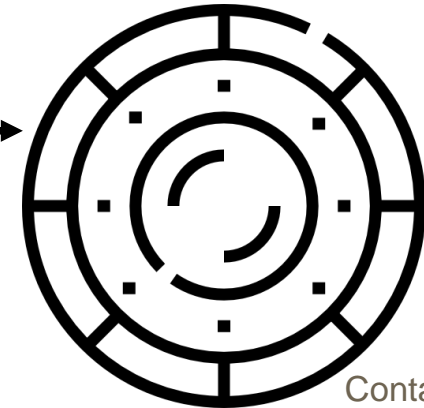


## 2. Blockchain & supply chains // “tokenization”

Physical asset



Digital asset



- As much information possible about the physical asset is digitized to create a “digital twin” – the token
- At every point of the supply chain, more information is added to the token (QR code attached to the packaging, certificates)
- The more unique a good is the easier it is to follow on the blockchain

Contains:

- Size/ colour
- Producer
- Certificate
- Packaging QR code
- ...



## 2. Blockchain & supply chains // Challenges

- Numerous “blockchain for supply chains” solution aims at facilitating logistics & shipments as blockchain performs really well in keeping track of transactions
- However, fewer initiatives are focusing on delivering goods with positive social & environmental impact.
- The difficulty lies in measuring impact at the very beginning of the supply chain (production methods, working conditions,...)

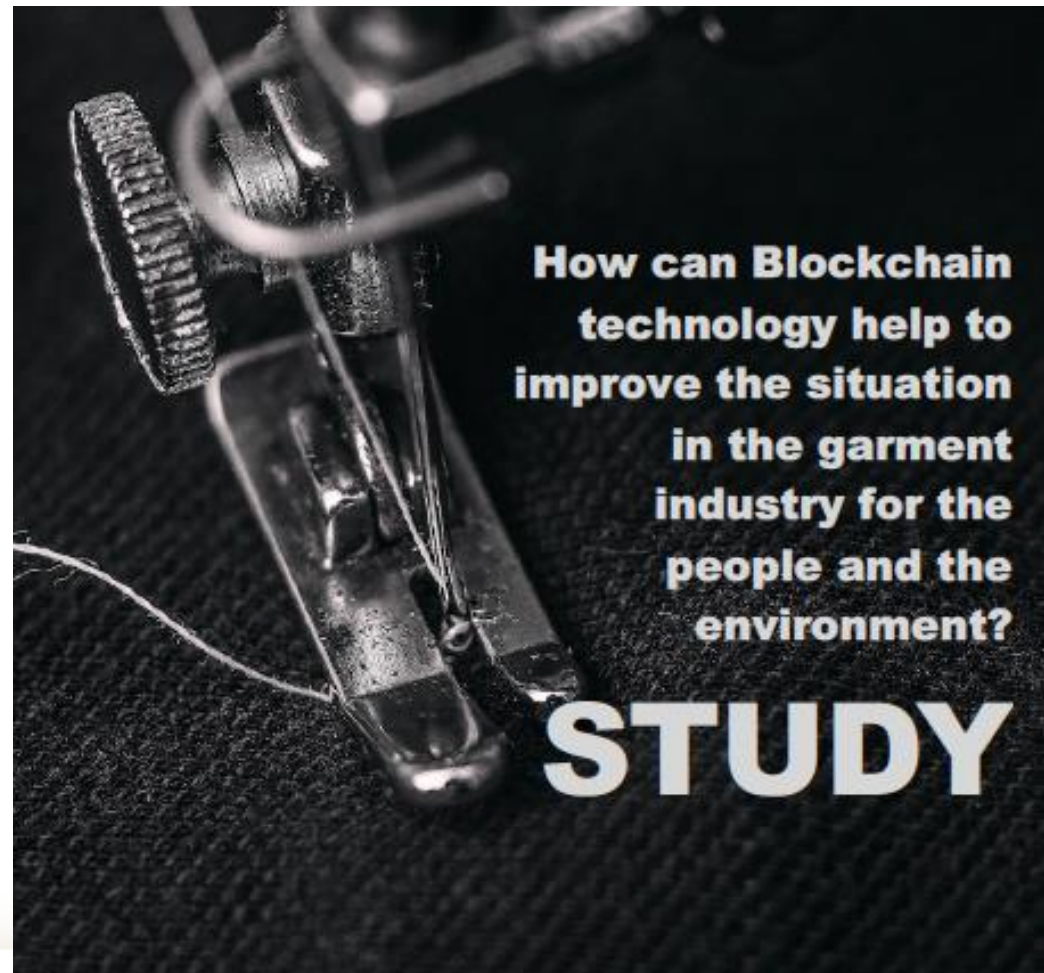


# 3. Blockchain for the garment industry



### 3. Blockchain for the garment industry

- Social aspects  
(improvement of working  
and living conditions)
- Environmental aspects  
(reduction of the  
environmental impact)
- Economic aspects  
(productivity and  
performance)





### 3. Blockchain for the garment industry

#### Internet of Things (IoT) devices for measuring environmental data

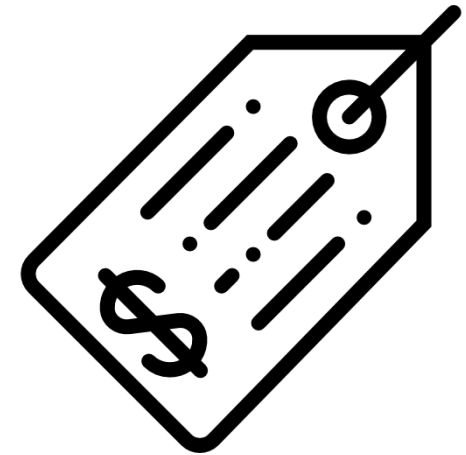
- For working conditions (temperature, humidity in factories)
  - To assess ecological impact (air and water quality, deforestation)
- In both cases, the data measured by the devices is uploaded on the blockchain and transformed into code that a smart contract can read
- The codified data can then act as a trigger for other actions – a factory that has maintained high water quality in the nearby river can be immediately financially rewarded







### 3. Blockchain for the garment industry



#### Tagging final products

- Factories that have been verified by NGOs, local actors, international organisations can tag their final products
- A digital asset is created on the blockchain and linked to that tag
- The consumer can scan the tag with her smartphone and check that the good was produced in a verified factory
- The solution still relies on human verification, which can be corrupted
- The production of the final product may have been fair, but how can we assess that all the elements (cotton, threads, dyes) have also been ethically sourced?
- The price of tags is prohibitory for small businesses



### 3. Blockchain for the garment industry

#### Alternative financing

- P2P lending and microinsurance products can fill the gap left by traditional financial services
- Immediate transactions and smart contracts could allow producers to be paid faster
- Does not solve the issue of ID which is often the cause of financial exclusion
- Social preferences can hinder widespread adoption





### 3. Blockchain for the garment industry // future prospects

→ Blockchain is a tool which can make processes more transparent. It has however, no agency or leverage without the willingness to increase sustainability or transparency.

→ In order to create the new transparency and sustainability standards, incentives such as consumers awareness have to be used, but is that sufficient?