



# Accelerate the adoption of blockchain

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**Robert Rongen**

3-5 November, 2021

Spark! Blockchain Conference, 16-06-2022



## Agenda Smartys workshop

1. Introduction
2. The Smartys platform
3. Intro Blockchain
4. Blockchain for supply chain
5. The Smartys use case
6. The Smartys solution
7. Demo

## Introduction

- Mechanical Engineering (BSc) and Technology and Innovation Management (MSc, TUE)
- 20 years in IT/Information Management @ Atos and Philips
- CTO/founder of [Smartys.eu](https://www.smartys.eu) -> Weconomics Solutions accelerator
- Contact:
  - [robert.rongen@blockchainadvies.nu](mailto:robert.rongen@blockchainadvies.nu)
  - WhatsApp: 06-5175 6870



BLOCKCHAIN IS A YOUNG  
POWERFUL TECHNOLOGY  
FULL OF POTENTIAL

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WHY HAS IT NOT  
REACHED ITS FULL  
POTENTIAL YET?

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# 31% LACK IN-HOUSE CAPABILITIES (SKILLS AND UNDERSTANDING)

Source: Deloitte's 2020 GlobalBlockchain Survey





# HOW TO LEARN ABOUT SMART CONTRACTS IN A SAFE ENVIRONMENT?

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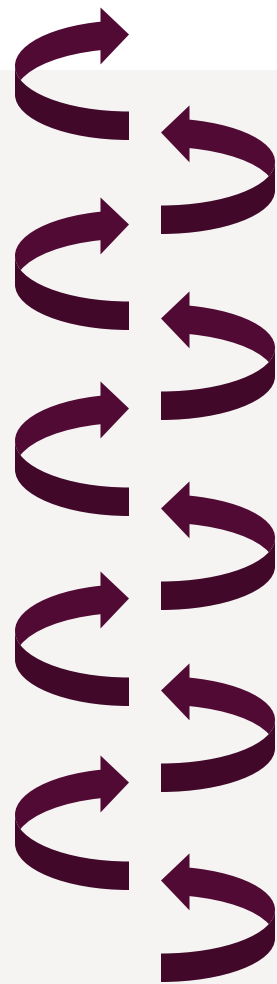
# INTERACTIVE SIMULATION IS THE ANSWER

**“Ondervinding  
is de beste leermeester”**





## Smartys activities



# Clients and Partners

## Higher education



## Logistics & FM



## Funding and other





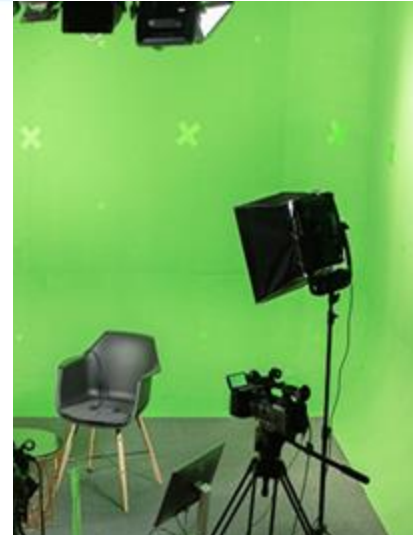
# Smartys/Weconomics part of Brainbloc Experience Lab at TU Eindhoven



Weconomics inspiration- and simulation solutions

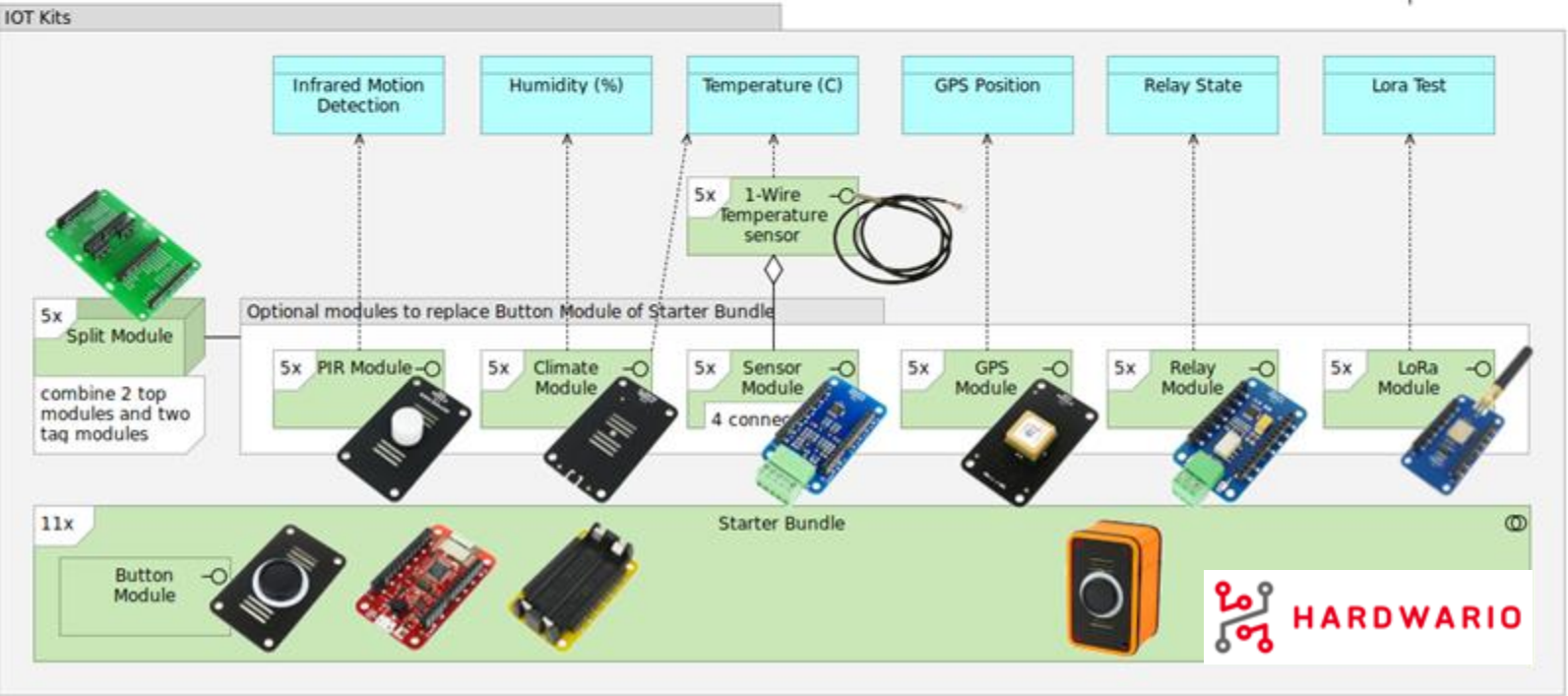
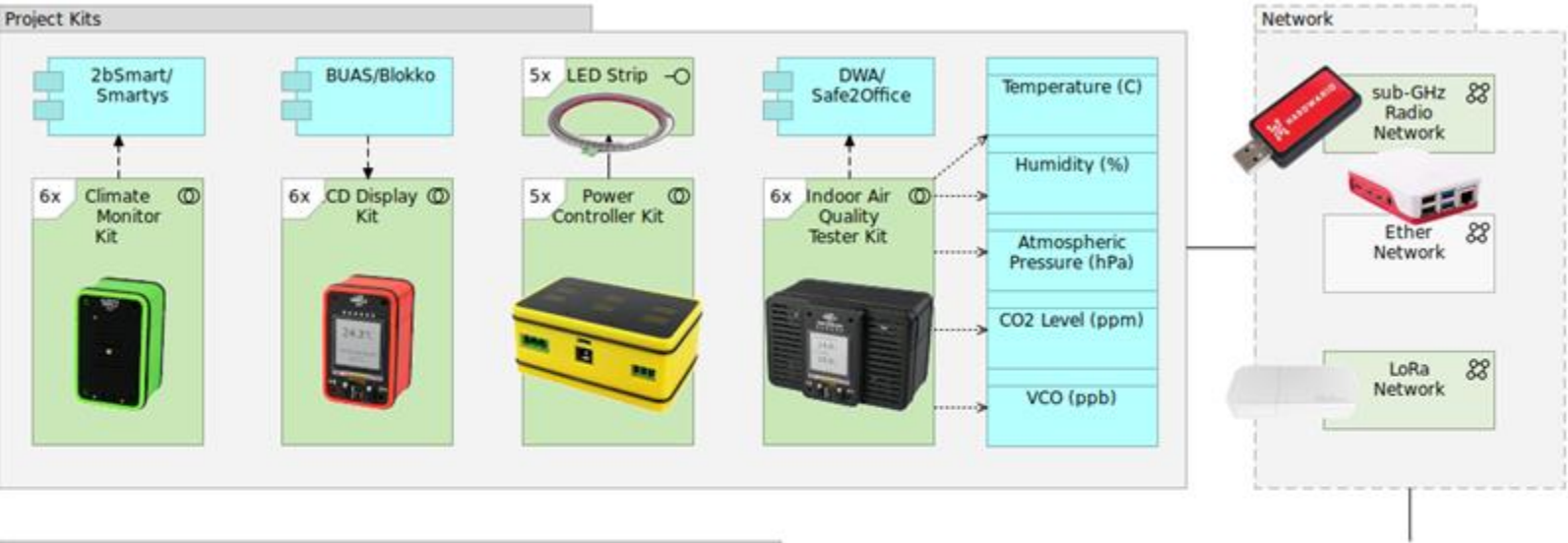
## Blockchain based digital assembly line experience lab

Awareness | Knowledge | Design | Transformation





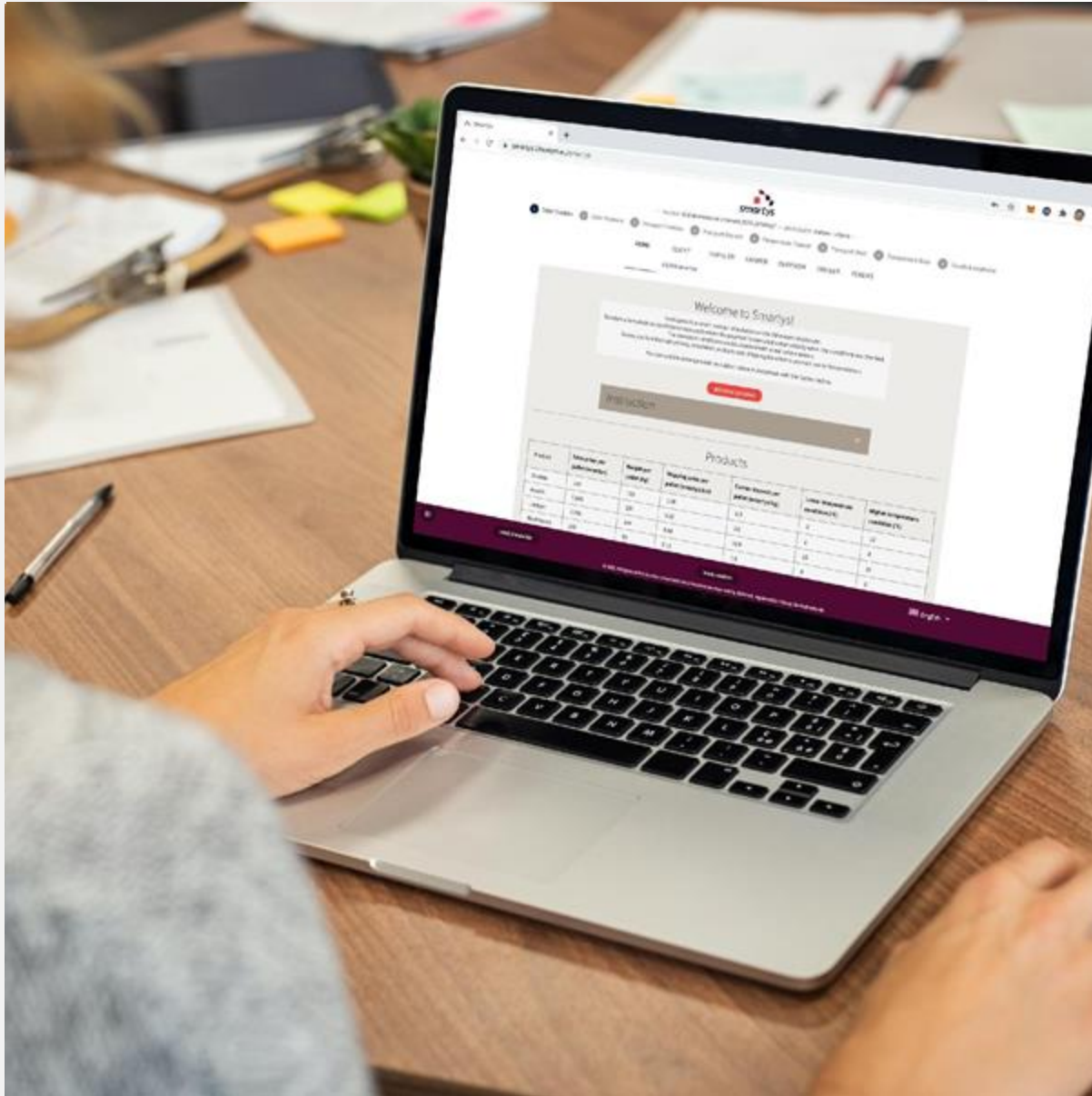
# Connected sensors



- "Plug-and-play" IOT sensors
- Connect sensors to Smartys via MQTT
- Optionally add buttons and displays







## What is Smartys?



Blockchain & IOT simulation platform



Workshop for students and business



Smart contract demo for logistics



Blueprint for a proof of concept



# Smartys demo modules -> Rapid Prototyping Platform in 2022



Temperature conditioned  
transport

Smart contracts  
Tokens (ERC777)  
Data storage on IPFS  
Integration with IoT sensors

Smartys - workshops of 3 hours



Time conditioned  
transport

Smart contracts  
Tokens (ERC777)  
Data storage on IPFS

Blokko



Non-Fungible  
Tokens

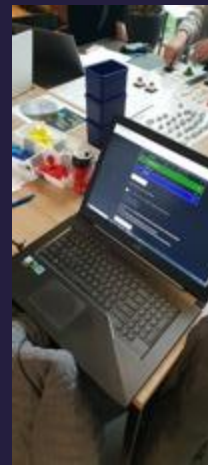
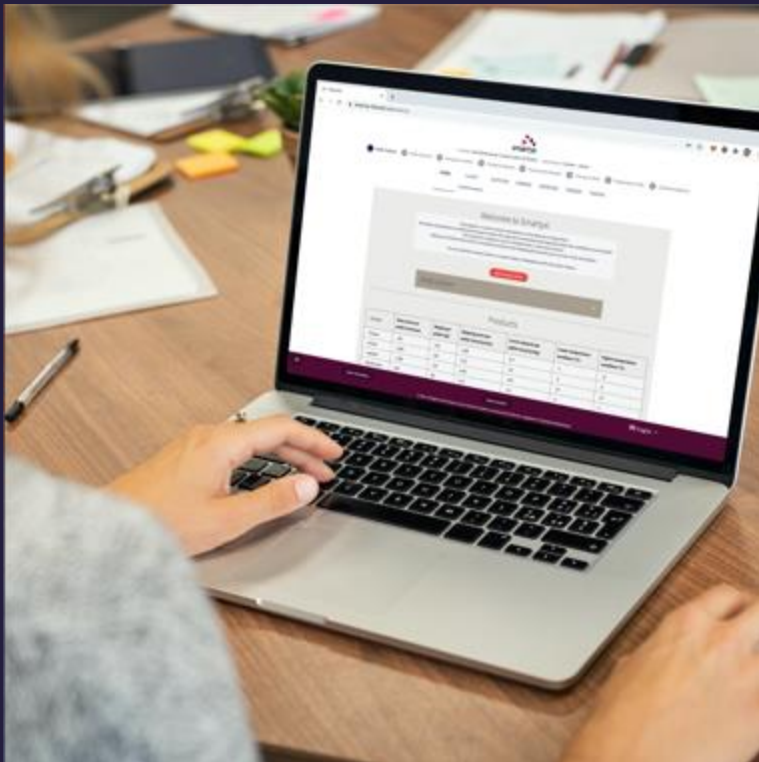
Smart contracts  
Tokens (ERC721)  
Market place for trading tokens

IsItCopernicus





# Blokkio on Blockchain: Serious gaming for Supply Chain





## Example project: Safe 2 Office app



- Live assessment of the contamination risk



- Sensors for air quality and people count

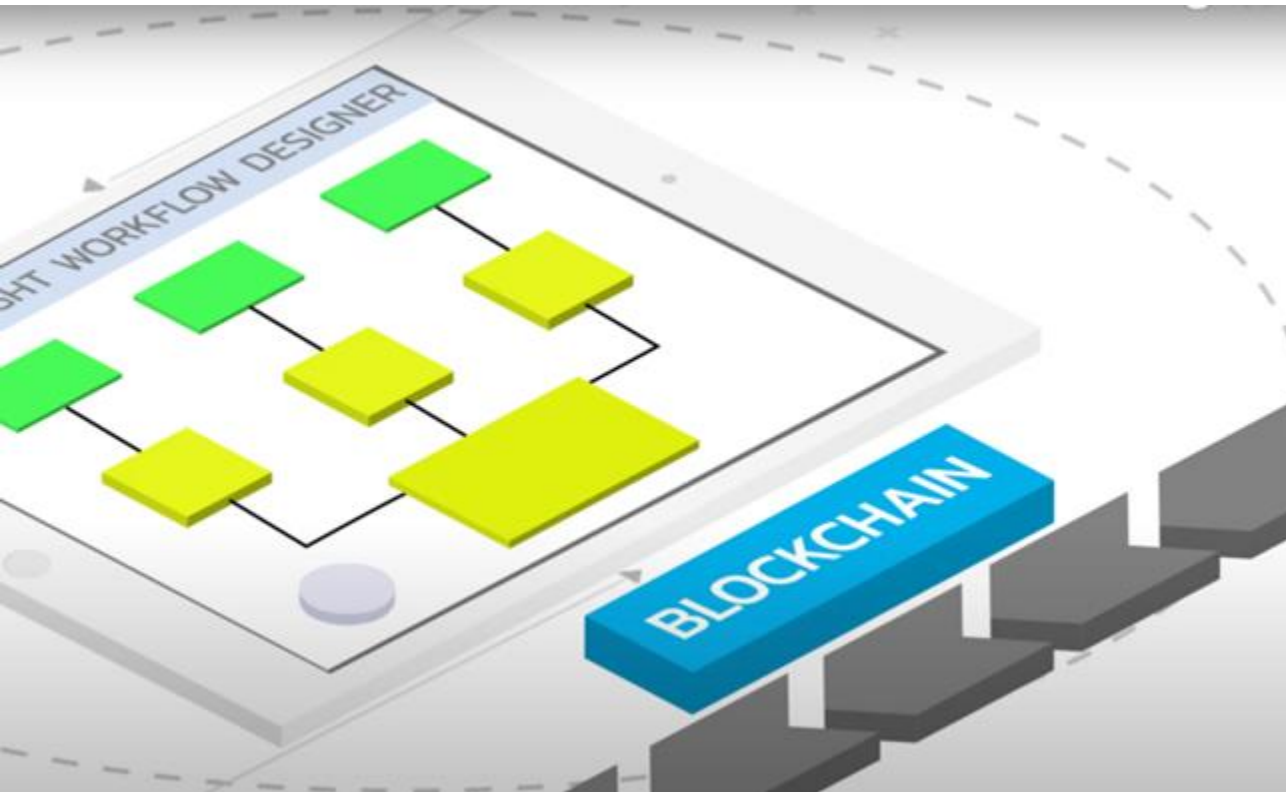


- 100% verifiable data on blockchain





# Smartys as Rapid Prototyping Platform



- Provide basic interface and connectivity

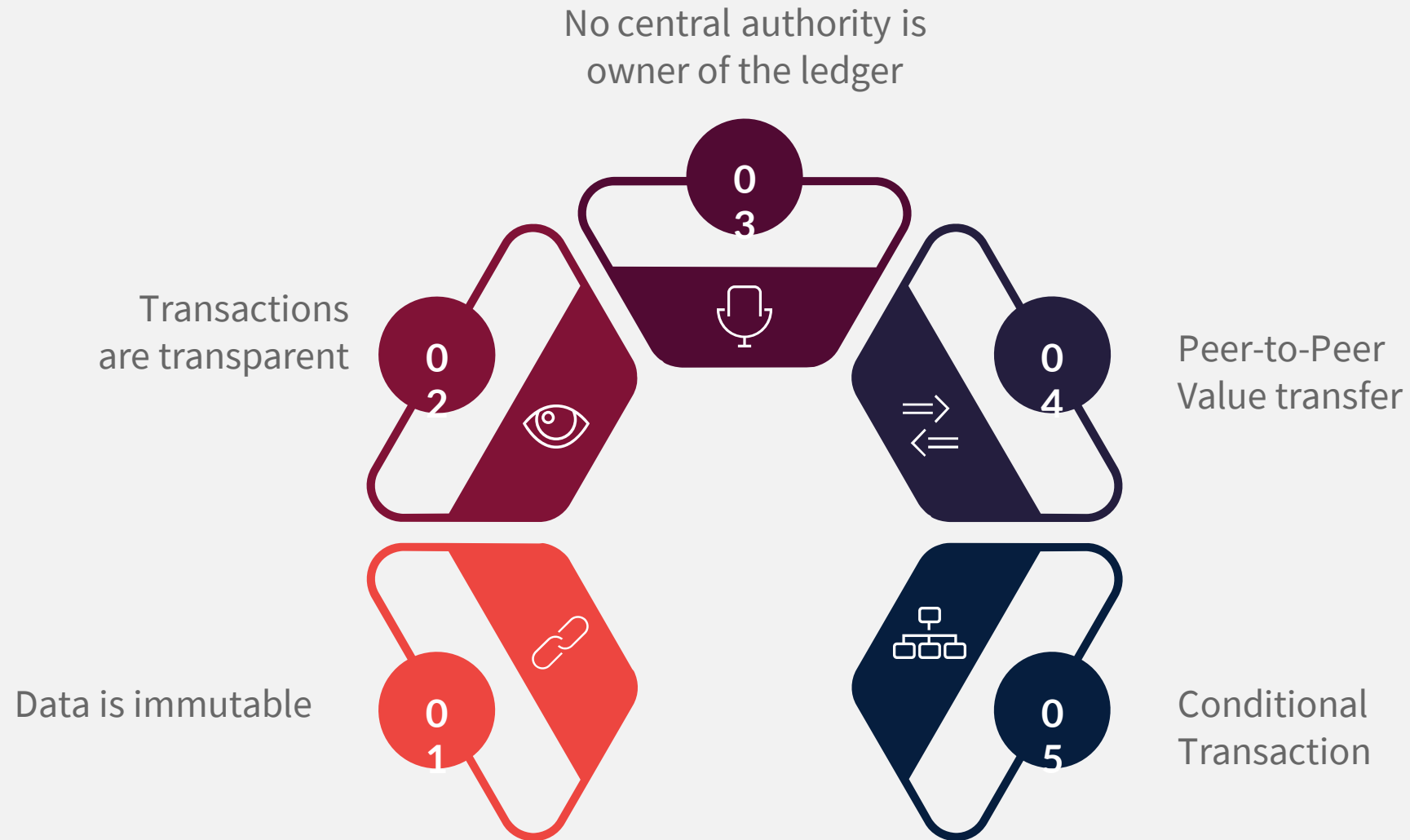


- Zero-code

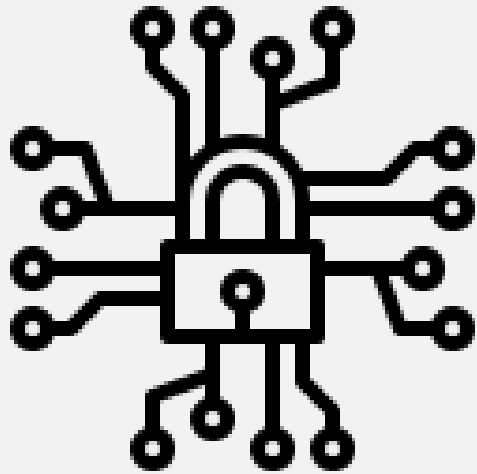


- Dynamic roles and conditions

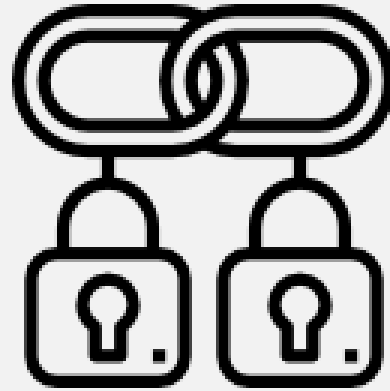
# Blockchain is a distributed ledger



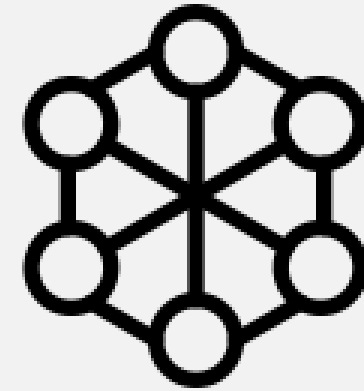
## Blockchain technology basics



Hash function



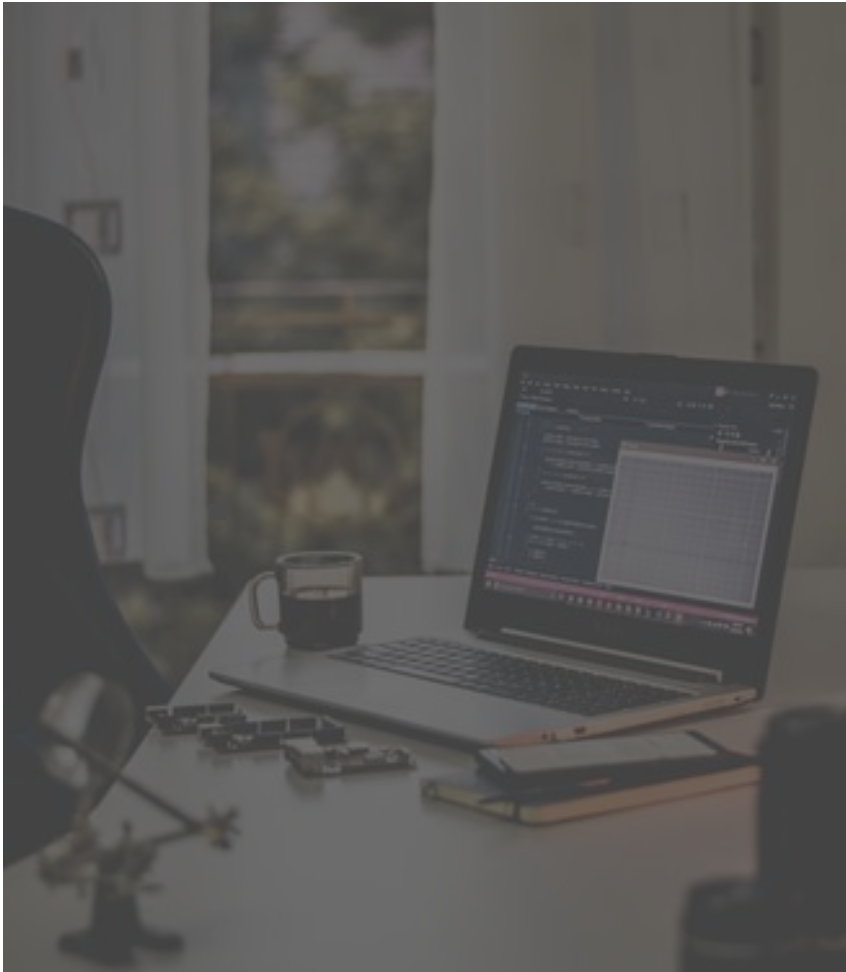
Digital signatures



Distributed network

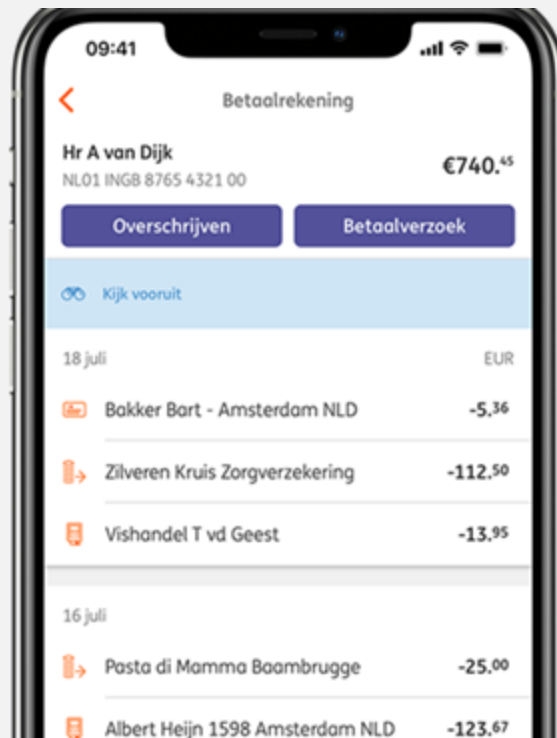


## The Smartys Token: A stablecoin pegged to the Euro



## Smart contract

Smart contracts allow multiple conditions to a value transfer



Temperature



Time



Receipt



Any sensor data

Smart contracts cannot be changed and will always be executed once conditions are met!

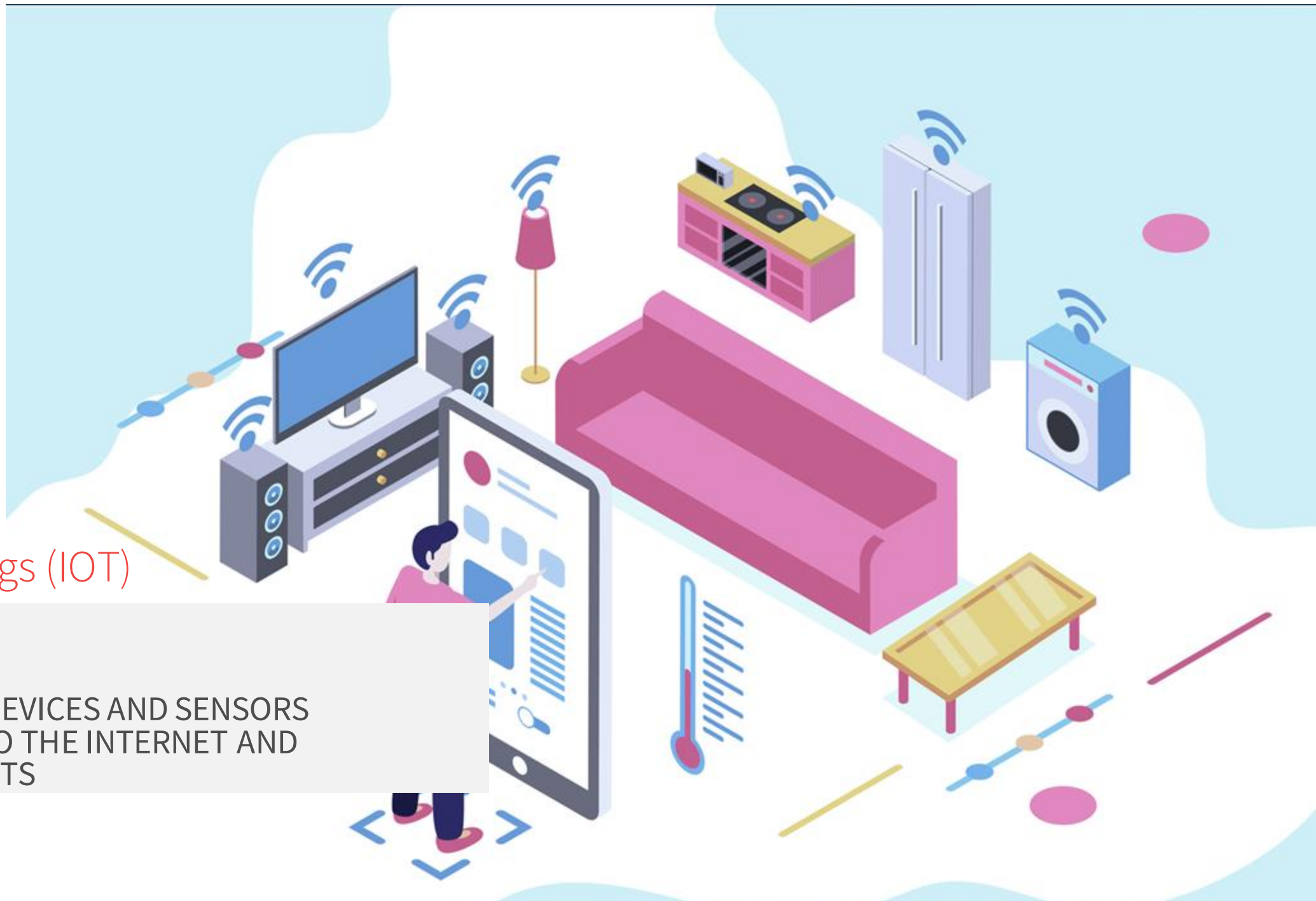




# Smart Contracts

- Enforce contract rules
- Specific conditions
- Event-driven programs
- Binding legal contracts?





## Internet of Things (IoT)

A NETWORK OF DEVICES AND SENSORS  
CONNECTED INTO THE INTERNET AND  
SMART CONTRACTS



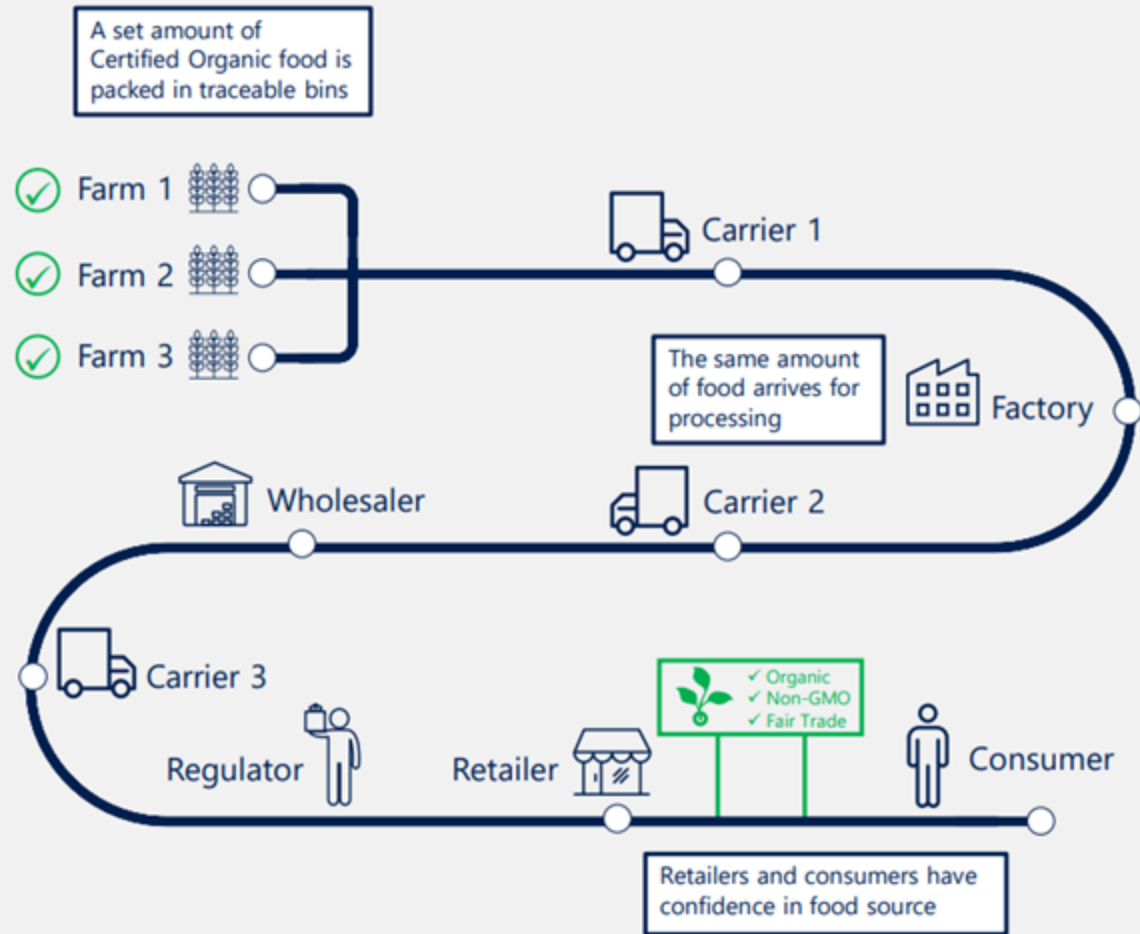
# Blockchain use cases in supply chain

Provenance attestations

Environmental monitoring

Dispute resolution

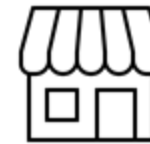




## Provenance attestations



- Recognition and market advantage for certifiable, ethical sourcing practices



- Decreased risk of counterfeit products and increased brand **loyalty** from consumers due to ability to accurately attest asset provenance



- Increased **confidence** in products; increased ability to discern between brands based on alignment with values



## Smart label example

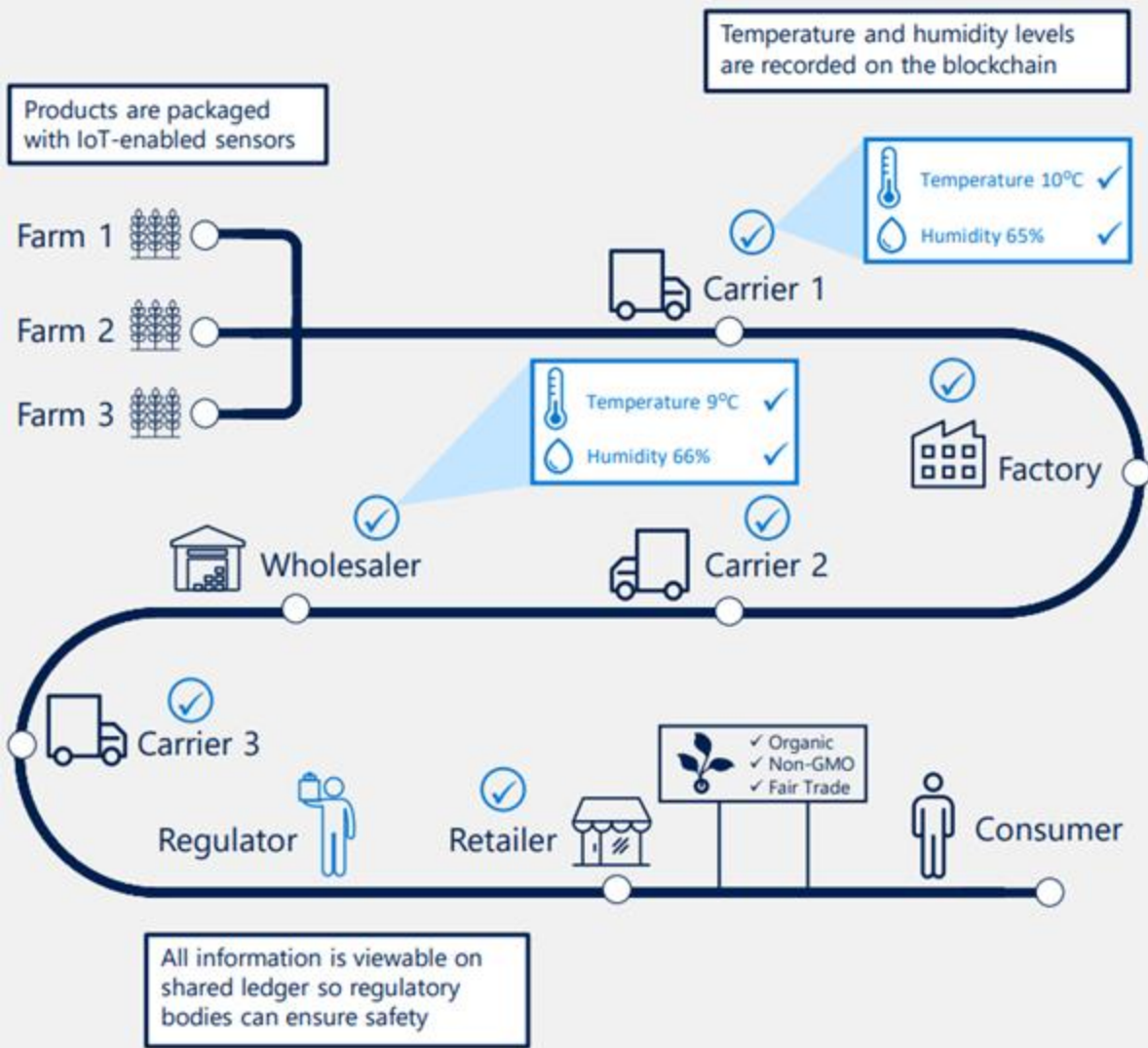
- Scan the QR code
- What do you see?



[scantrust](#)

## Food supply chain

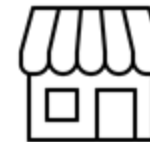




## Environmental monitoring



- Real-time visibility into product handling and a high-assurance audit log to ensure contract conditions have been fulfilled



- Consumer and brand protection; more efficient process for finding fault points and enforcing contractual penalties



- Increased assurance of the safety and quality of good





# Modum's Perspective on the Covid-19 Vaccine Rollout

MODUM 21/01/21 14:31

*Securing the Pharmaceutical supply chain is more important than ever before— a planet's health depends on it.*



# Modum shipment detail

modum

DeviationsShipmentsConfiguration

Generate report

## Shipment Detail

Shipment-ID: 99.34.137967.00027548

Examination Required  
A temperature deviation occurred during the transport of this shipment. How do you want to proceed?

ACCEPTINVESTIGATE

### Temperature Curve

Show: Raw DataSmoothed

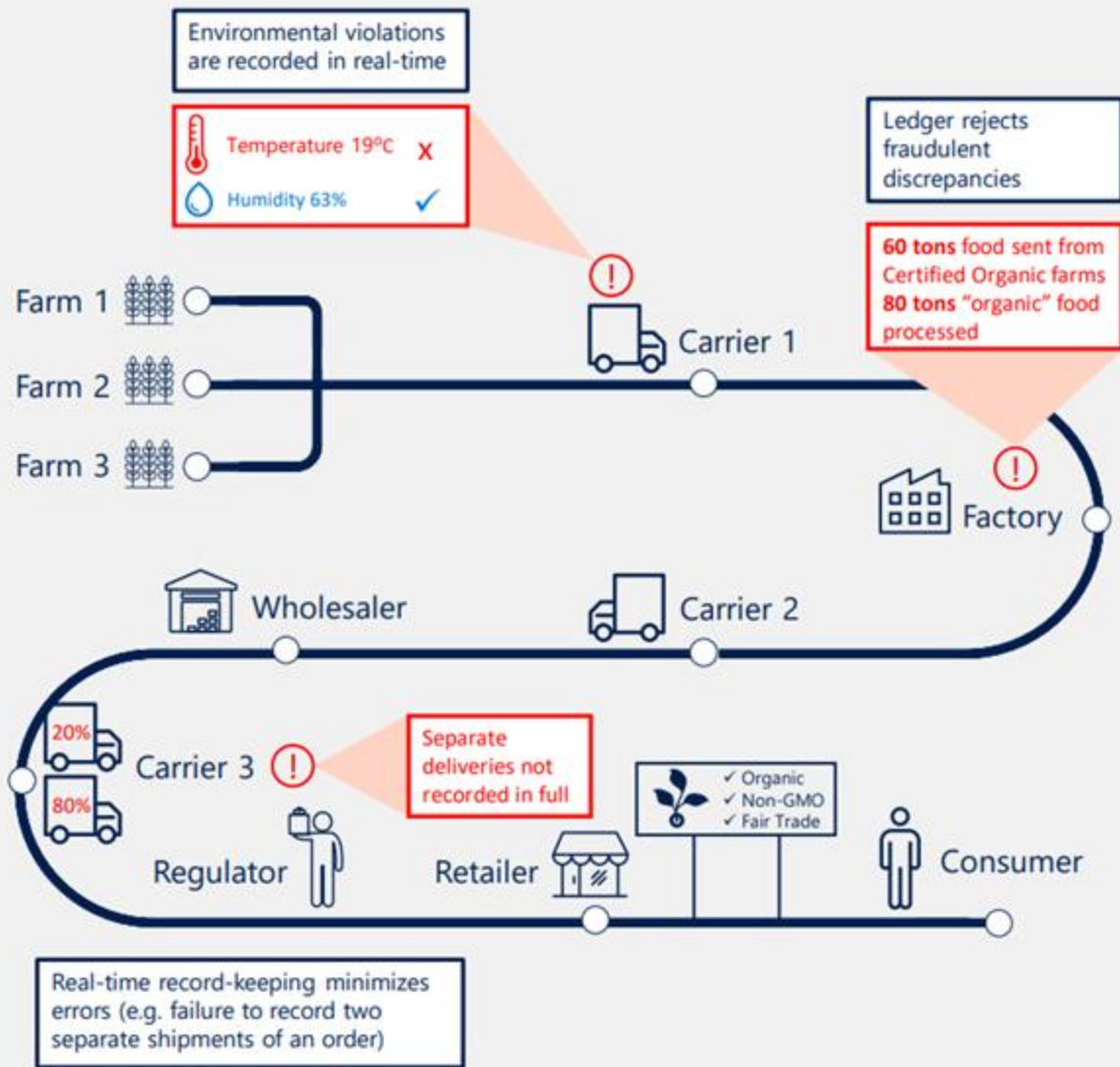
Date	Temperature (°C)
24.07.18	15
24.07.18	25
25.07.18	29.8
27.07.18	14.2
28.07.18	15

Shipment Information

Shipment state Examination Required

Shipment Deviations

Specified Recorded



## Dispute resolution



- Ability to undeniably prove on-time and in-full delivery



- Efficient dispute resolution when conditions are not met



- Lower frequency of out-of-stock goods







## The use case for the Simulation

- Sweetchew exports Dutch Stroopwafels to Southeast Asia by road & plane





## To Deliver in the event of damage



- Written liability letter



- Official damage report Cargo company



- Compensation form



- Photos







บริษัท สวีทเชว มาย เอ็มเอ็ม จำกัด SweetChew by MN Co.,Ltd.  
สำนักงานใหญ่ 29/126 ซ.5 ม.9 ต.บางพลีใหญ่ อ.บางพลี จ.สมุทรปราการ 11129  
29/126 Soi 5 Moo 9 Tambon Bangplid, Parkrid City, Nonthaburi 11129  
Tel : 045-889-6665 Fax : 02-503-2876 เลขที่บัญชีธนาคาร 8125557002102

27/04/2016

Dear Turkish Airlines

Subject Reclaiming of damaged goods AWB 23510556265

In the name of, Sweetchew by MN Co.,Ltd, we hereby give notice to you, Turkish Airlines, that the following goods, STROOPWAFELS, were received damaged, from you by BFS Cargo.

Our goods called STROOPWAFELS, had been shipped by Flight No. TK068 and received by BFS Cargo on the 18/04/2016.

Our AIR WAY BILL No. is 23510556265.

We received the damaged goods from BFS Cargo on 19/04/2016.

We have received and verified the BFS Cargo report (Cargo Irregularity / Damage Report) of the delivered goods of 5 containers (400 boxes), and have determined 88 of 400 boxes to have been delivered damaged.

We hereby acknowledge receipt of the damaged goods from BFS Cargo and reserve our right to claim for damages from all parties concerned.

We have determined the damaged good to be 22% (88 boxes of 400 boxes) of the goods delivered and are making the claim for compensation from you for the following:

- the amount of 22% of the damaged goods of 32,947.20 THB.
- the amount of 22% of the Customs Import Duty of the damaged goods of 11,793.76 THB
- the amount of 22% of the VAT of 4,953.30 THB

The total compensation claimed totals 49,694.26 THB.

We have enclosed:

**BFS CARGO** Cargo Irregularity / Damage Report  
ใบรายงานสินค้าชำรุดและเสียหาย

Reference No: BFS/CDY342981  
AWB No: 235-10556265  
Flight No: 6

Origin	Destination	Flight / Date	Point of loading	Point of Unloading	Content as per AWB
AMS	BKK	268 / 18 Apr 16	IST	BKK	01 STROOPWAFELS

1. TYPE OF IRREGULARITY/ความเสียหายที่เกิดขึ้น

☐ Loss (Shipment) / เสียหาย  
Total PGMW as per document: 880 kg  
Total PGMW on board after the weight: 880 kg  
Total Difference/ความเสียหาย: 880 kg

☐ Damaged Shipment / เสียหาย  
Total PGMW as per document: 880 kg  
Total PGMW on board after the weight: 880 kg  
Total Difference/ความเสียหาย: 880 kg

2. PACKAGING DETAILS/รายละเอียดการบรรจุหีบห่อ

Container/Container type: 40' High Cube  
Type of outer packaging: 40' High Cube  
Condition of outer packaging: 40' High Cube  
Marks & Labels: 40' High Cube  
Type of Damage of outer packaging: 40' High Cube

3. DETAILS OF DAMAGE AS OBSERVED/รายละเอียดการชำรุดเสียหายที่พบ

Type of inner packing: 40' High Cube  
Condition of inner packing: 40' High Cube  
Type of Damage of inner packing: 40' High Cube

4. Remarks (please LIVE AIRMAIL, describe item type of injury or damage) / หมายเหตุ (โปรดใช้ LIVE AIRMAIL, ระบุประเภทของสินค้าที่เสียหาย)

5. Details of cargo irregularity / รายละเอียดการชำรุดเสียหาย  
Found cargo damaged on PNC214757X total 1 Pieces / 449 Kgs, and cargo condition was ripped.

6. ACTION TAKEN/การดำเนินการ

7. Signature / อนุมัติ

8. Date & Time / วันที่และเวลา

**TURKISH AIRLINES** APPLICATION FORM FOR COMPENSATION  
A STAR ALLIANCE MEMBER

Application Date: 13 Jul 2016

AWB No: 235-10556265

Type of problem: Low\* ☐ Deficiency\* ☐ Damage\* ☒ Package damage ☐ Delayed delivery ☐ Extra Costs\* ☐

Content damage: ☐

Number of containers\* 1...5  
Number of pieces 1...400 boxes  
Weight\* 1...2245 kg

Amount of problems  
Number of containers\* 1...5  
Number of pieces 1...88 boxes  
Weight (kg)\* 1...493.2 kg

Type of package\*: cardboard boxes  
Content of the cargo\*: Stroopwafels (Dutch cookies)

Your reason for claim\*:  
We acknowledged that 88 out of 400 cartons were damaged during transport. Turkish Airlines qualified the pallets by mistake as stockable instead of non-stockable. The boxes collapsed making 88 boxes the stroopwafels worthless for consumption.

Please provide information on what has happened to the cargo subject to the problem\*:  
When we received the pallets the carton boxes were collapsed and pressed together, mostly on the lower part of the pallet. (see the images), making the stroopwafels worthless for consumption.

Are the goods specified in the amount of problems in useable condition\*: Yes ☐ No ☒ Partially ☐

Have any salvage charges been incurred\*: Yes ☐ No ☒

Salvage charges\*: 0

Amount of compensation claimed\*: 49,694.26 baht

How have you determined the amount\*:  
88 boxes of the total of 400 boxes, -22% damaged.  
22% of 3,744 = 823.68 euro x 40 = 32,947.20 baht  
Custom costs:  
Import Duty (20%): 83,808 baht VAT: 22,818 baht  
Total custom costs: 76,123 baht (22% of 76,123 = 16,747.06)  
Total Claiming: 16,747.06 + 32,947.20 = 49,694.26 baht

Name (Surname):  
Company name:  
Contact address:  
E-mail:  
Telephone number:

Signature (Name):  
Signature (Name):  
Signature (Name):

Date & Time: Apr 2016 / 18-19 Date & Time: May 2016 / 13-14 Date & Time: May 2016 / 13-14

CGO-02-FO-0012 Cargo Irregularity / Damage Report, Rev 04, Effective date: 21 Aug 2013



# The use case for the simulation



7 months process

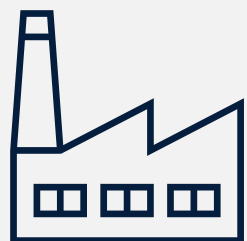
No transparency



Costs 25% of value  
of the goods



# The current process



Supplier

25°

27°

28°

29°

32°

35°

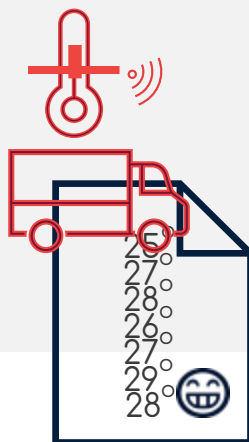
28°



Bank



Transport costs  
Costs of goods



Carrier



## The challenge



Easier and quicker settlement



Financial assurance



Transparent:  
no tampering with data

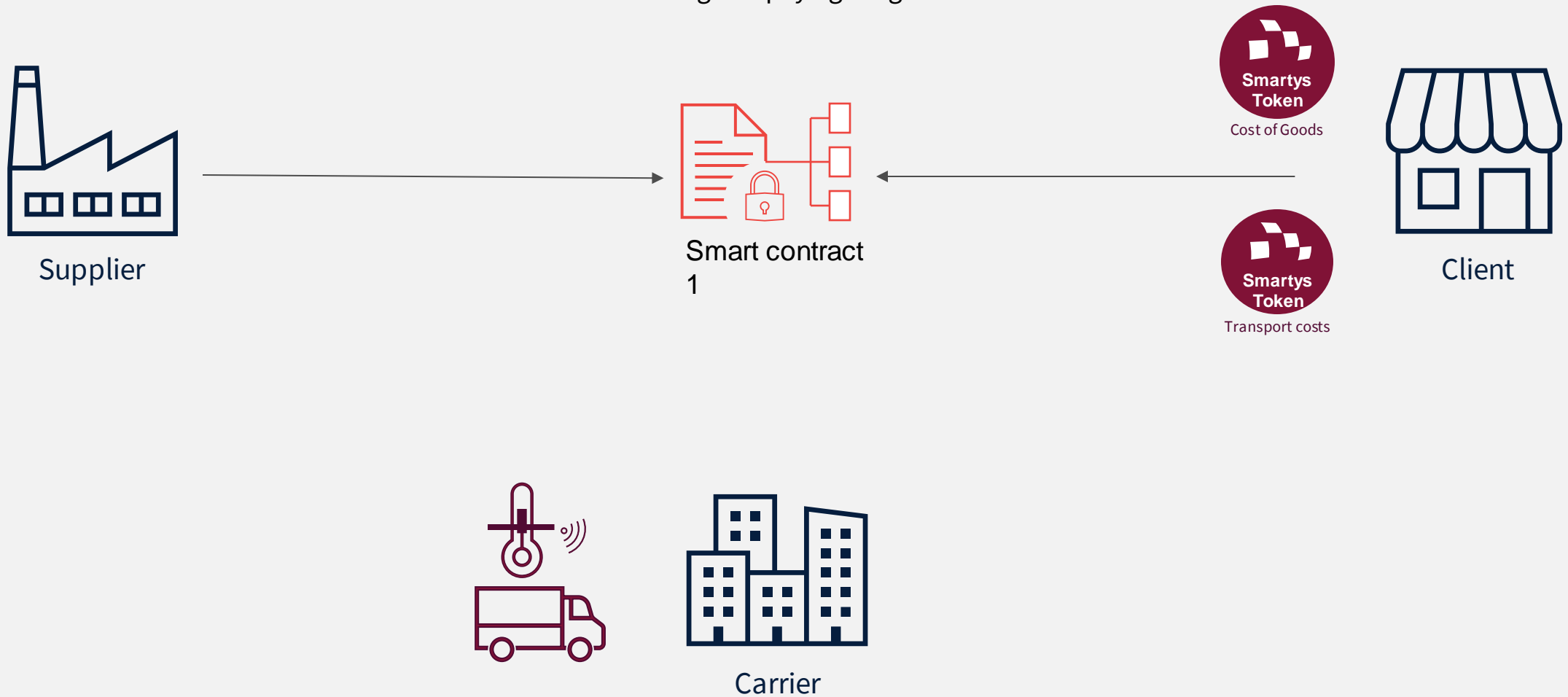
We can solve this with  
blockchain and smart  
contracts,





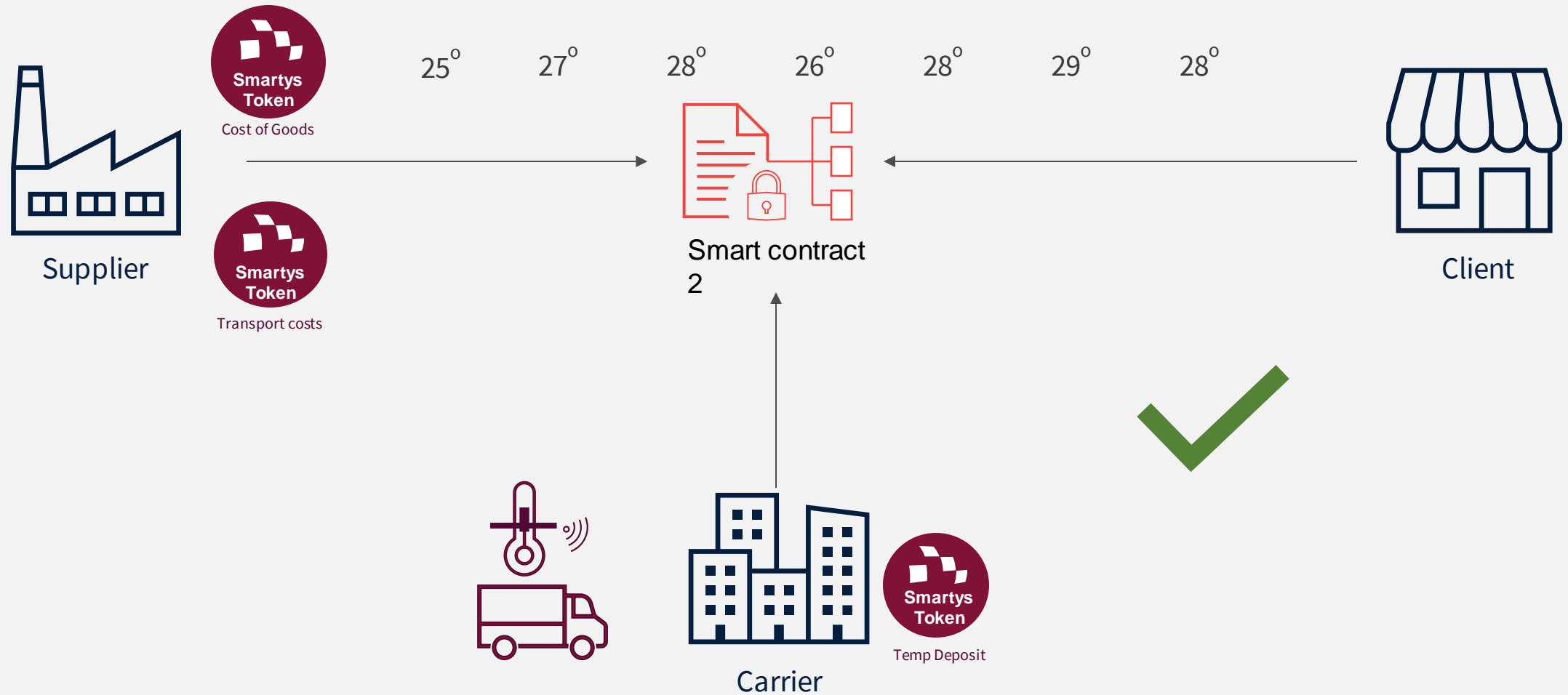
# The new Smartys process – green scenario

## Part 1: Ordering and paying the goods



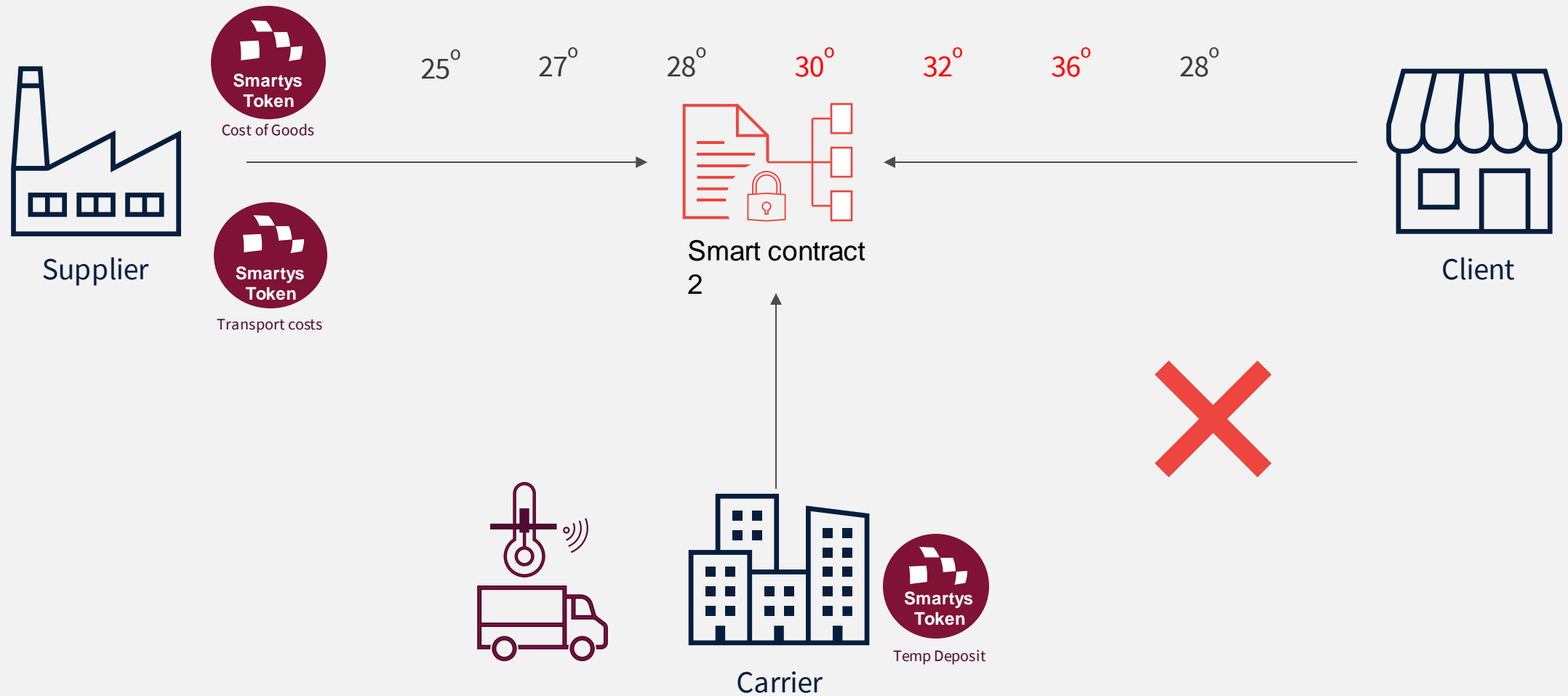
# The new Smartys process – green scenario

## 2. Arranging and executing the transport




# The new Smartys process – red scenario

## 2. Arranging and executing the transport





# Smartys: An interactive smart contract demo



HOME

CLIENT

SUPPLIER

CARRIER

OVERVIEW

TRAINER

TOKENS

trainer - client  
29,519 smartys

trainer - supplier  
165,998 smartys

trainer - carrier  
95,706 smartys

participant: **trainer - client**  
session: 615045 "Demo"

✔ Order Creation

✔ Order Payment

✔ Transport Creation

✔ Transport Deposit

✔ Temperature Deposit

✔ Transport Start

✔ Temperature Data

✔ Goods Acceptance

Shipment delivered and settled

Transport settlement

The lowest measured temperature was 24 degrees.

The highest measured temperature was 29 degrees.

This is outside of the agreed temperature range of 15 to 27 degrees.

The [client](#) pays 7,200 smartys to the [supplier](#) for the cost of the goods.

The [client](#) pays 80 smartys to the [supplier](#) for the cost of the transport.

The [client](#) receives 1,440 smartys from the [temperature deposit](#) as compensation for the damage to the goods

The [supplier](#) pays 80 smartys to the [carrier](#) for the cost of the transport

The [carrier](#) receives 80 smartys for the cost of the transport.

Temperature data

Minimum

Maximum

24 °C

29 °C

Order contract

Order ID	Product name	Pallets	From	To	Distance	Cost of goods	Cost of transport	Paid
354	laptops	1	Tilburg	Milan	1,000	7,200	80	Yes

Order contract: [0xe513670d42f6b1CBa88D2c28Fd0a9ff4C3397055](#)

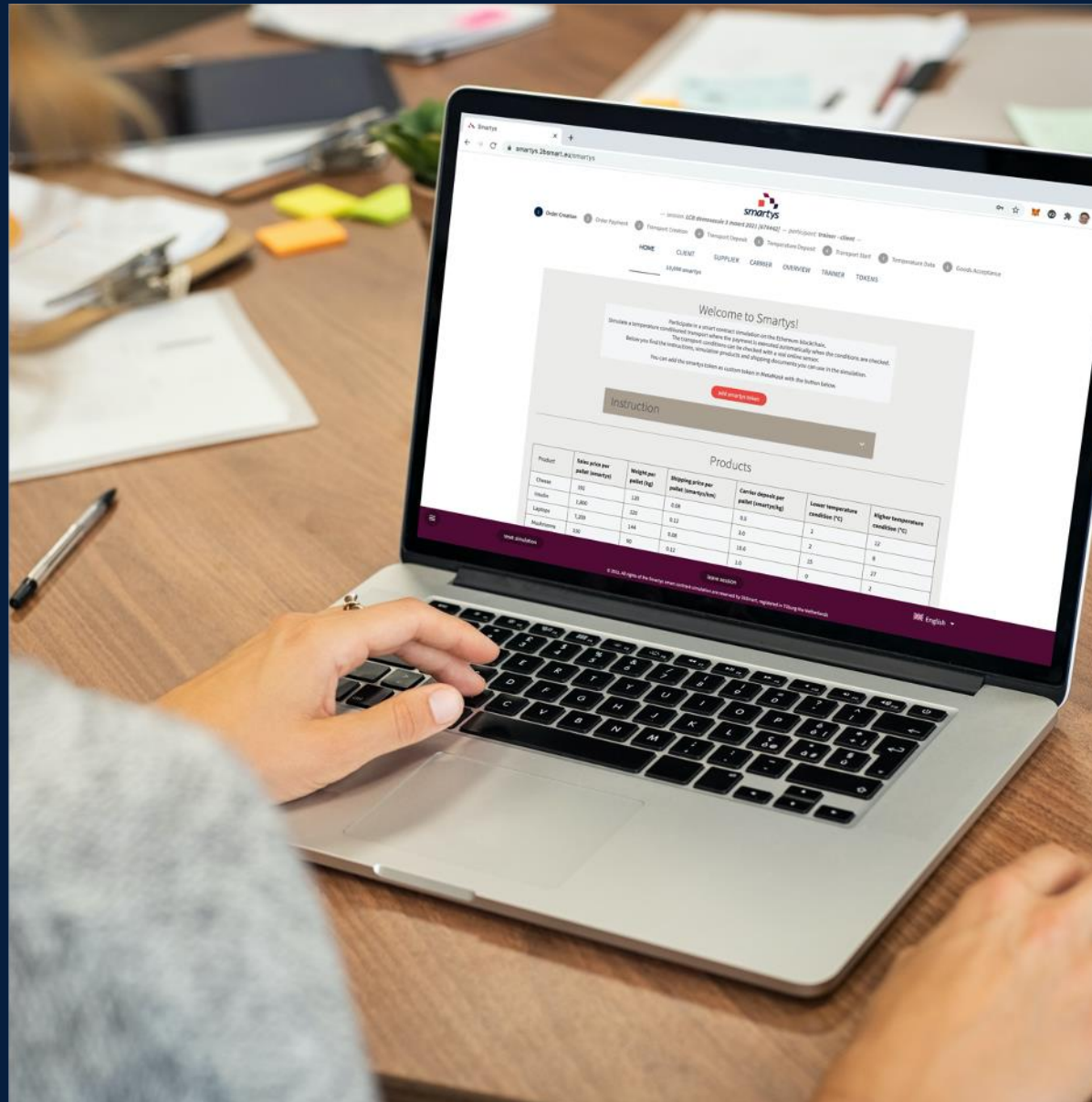
Order creation transaction: [0x264a58...a8469c](#) [confirmed]

Order payment transaction: [0xf0f75b...e4faad](#) [confirmed]

Order document: [QmWCPkc9...7UBhmS](#) [confirmed]

Experience automatic dispute resolution of temperature-controlled transports

# Demo!





# Thank you

Feel free to contact



Smartys is a product of [smartys.eu](https://smartys.eu)



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