Defining Today's Technology Standards; Empowering Tomorrow's Solutions.

# Digital Product Passport (DPP) and Standardized Secure Product Verification for Originality and Quality (SPOQ)

17 October 2023

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**Dom Guinard, Digimarc**
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# Meet the Speakers

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Senior Project Manager,
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The views expressed/presented are that of the individual speaker and do not necessarily represent the views of the speakers' respective company.

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# Digital Product Passport and GS1 Standardization

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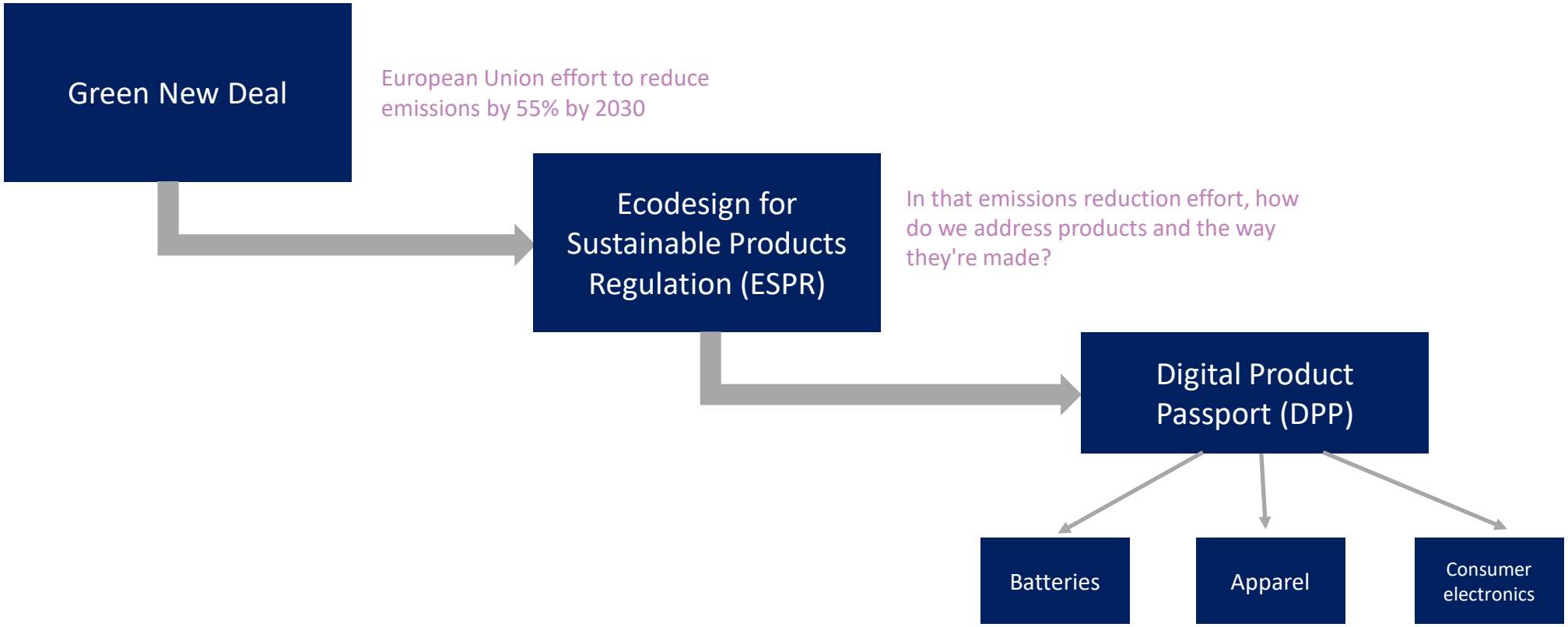
**Community Engagement Director**
**GS1 Global Office**


Green New Deal
European Union effort to reduce emissions by 55% by 2030
Ecodesign for Sustainable Products Regulation (ESPR)
In that emissions reduction effort, how do we address products and the way they're made?
Digital Product Passport (DPP)
Batteries
Apparel
Consumer electronics

# What will the DPP really be?

**Digital Product Passport (DPP)**

## DPP System

- All standards and protocols related to the IT architecture, like standards on:
  - Data carriers and unique identifiers
  - Access rights management
  - Interoperability (technical, semantic, organisation), including data exchange protocols and formats
  - Data storage
  - Data processing (introduction, modification, update)
  - Data authentication, reliability, and integrity
  - Data security and privacy
- The DPP registry

## DPP Data

**Possible Track & Trace identifiers**

- Economic operator's name, registered trade name
- Global Trade Identification Number or equivalent
- TARIC code or equivalent
- Global location number or equivalent
- Authorised representative
- …

**Example of potential attributes**

- Description of the material, component, or product
- Recycled content
- Substances of concern
- Environmental footprint profile
- Classes of performance
- Technical parameters
- …

European Commission

# Key DPP elements

- Persistent, unique identification
- Multistakeholder access to data
- Interoperability

# Where will GS1 work on the DPP?

## DPP & Circularity MSWG

- Standards creation body
- Collaborative, neutral and IP protected process
- Currently focusing on building Automatic Identification Data Capture protocols
- Will mirror legislation

## GS1 Application Standard

- Focus on AIDC first
- Currently doing definition work
- Sector agnostic basis
- Done in coordination with other standards efforts

## AS Implementation Guidelines

- Sector agnostic implementation guideline will be put in place first
- Additional sector specific guidelines will be developed with input from industry

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DIGIMARC

Agro2Circular

The hidden value of agrifood sector residues

# Digital Product Passport Pilots & SPOQ

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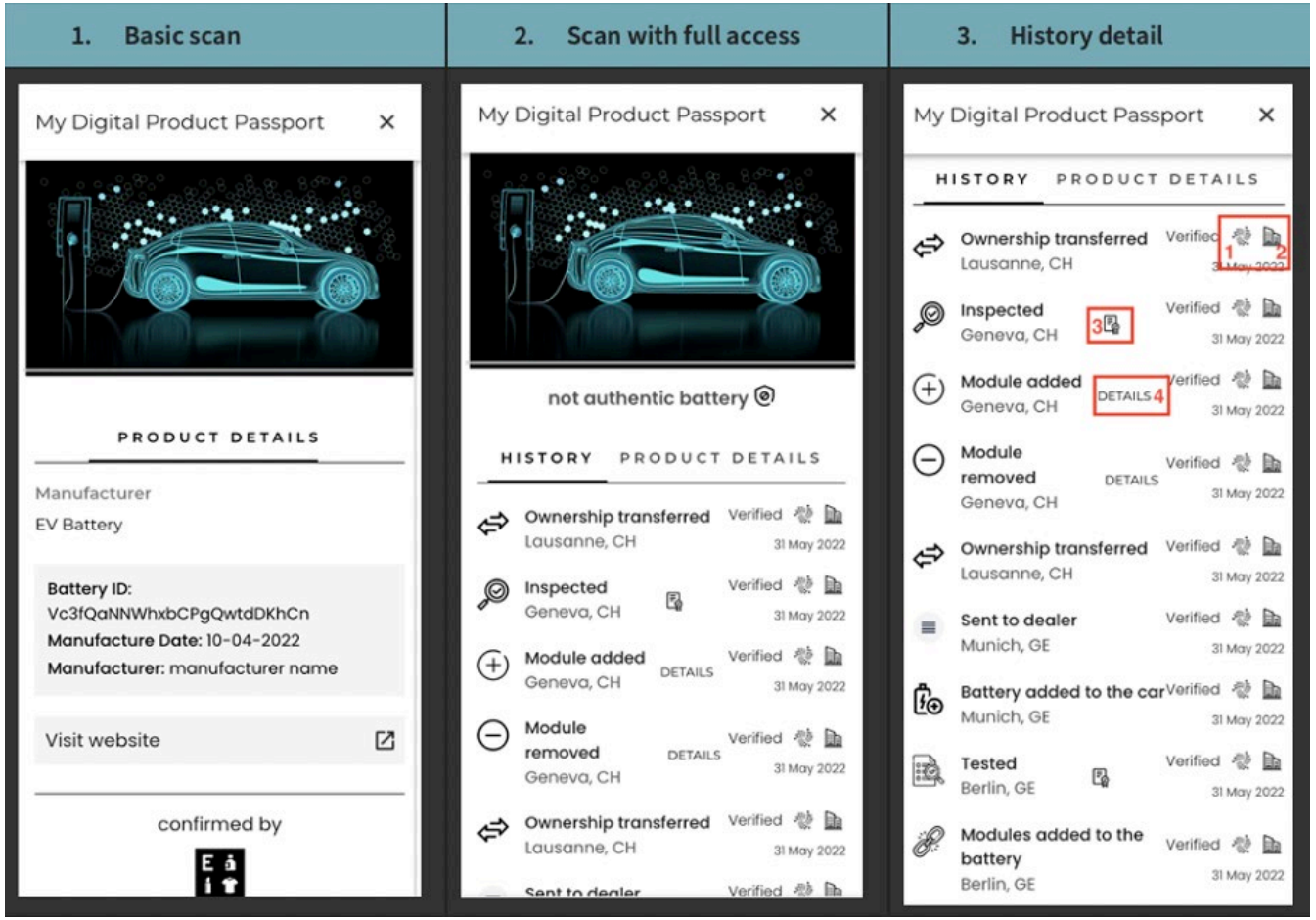
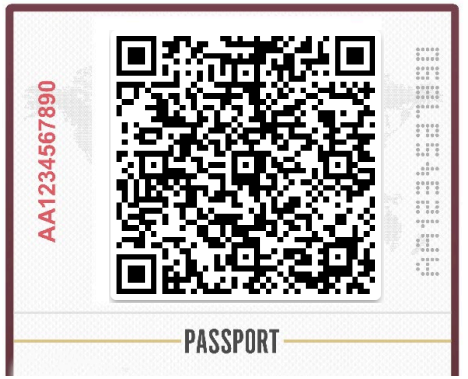
**Dom Guinard**
**Vice President**
**Digimarc**

# Pilot 1: Digital Product Passport for EV Batteries

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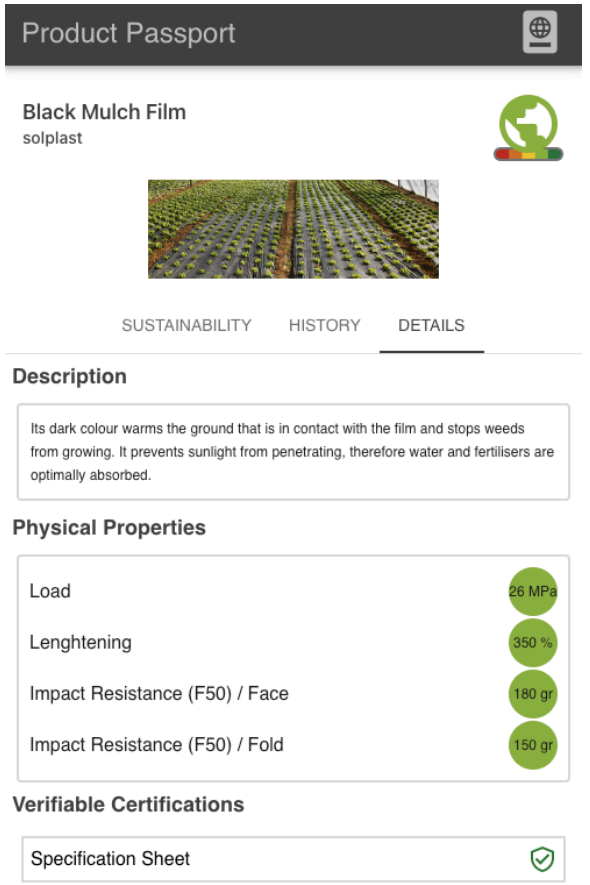
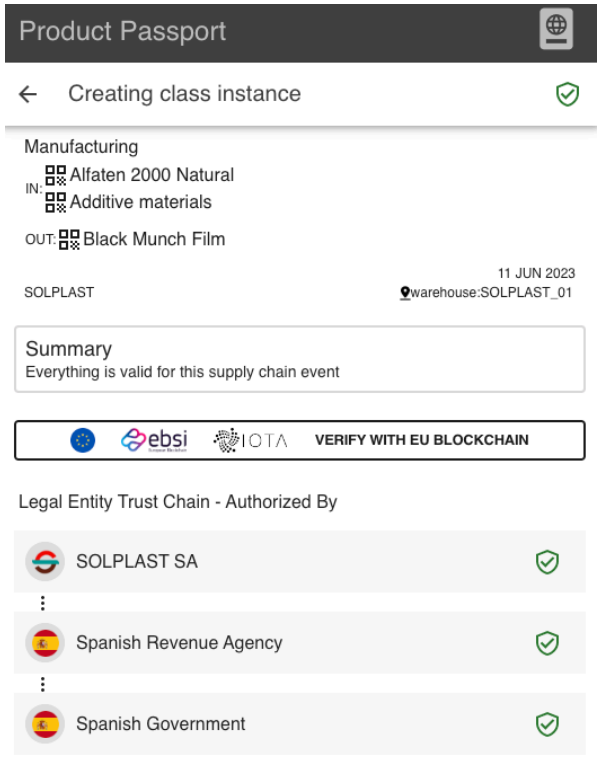
# Pilot 2: Digital Product Passport for Plastic Upcycling

Agro2Circular

The hidden value of agrifood sector residues

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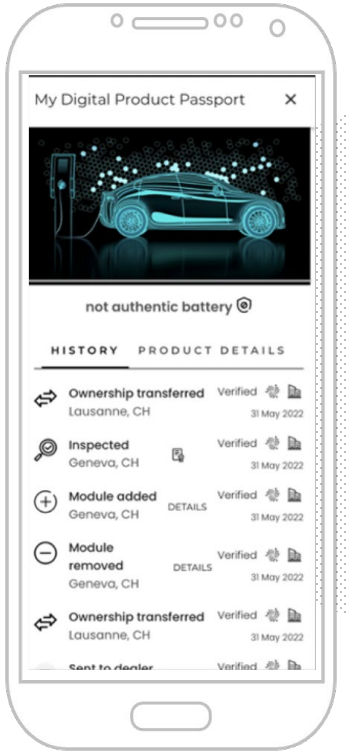
# Digital Product Passport & EU Blockchain Blueprint

[Blog & Video - DPP & blockchain blueprint]

# Digital Product Passport & SPOQ – Overlapping Approaches for Different Use Cases




**Standard based carrier & identity – e.g., GS1 Digital Link**

Standard based events & masterdata – e.g., GS1 EPCIS, GS1 Web Vocabulary

**Data & identity requirements on a per product category basis**

Durability – outlive a brand or service provider

**Decentralized – multiple & authenticated data sources**

Granularity – different actors have access to different data

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# SPOQ
# Standardized Secure Product Verification to Protect Originality and Quality

17 October 2023

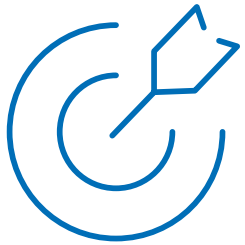
**Dr. Katharina von Knop**
**Senior Project Manager, Digital Trust**
**VDE**

# SPOQ
**S**tandardized secure
**P**roductverification to protect
**O**riginality and **Q**uality

Dr. Katharina von Knop

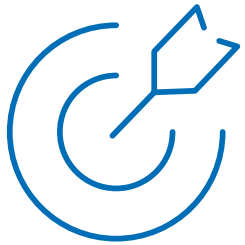
Verband für Elektrotechnik
Elektronik Informationstechnik
e.V.

# For our R&D project we defined 4 goals



## Originality

Product & Producer verification must be resilient against counterfeiting attempts

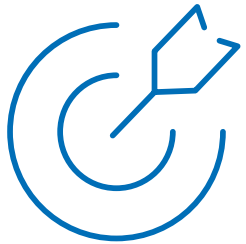


## Information Integrity

Existing product information must not be alterable

## Efficiancy

Process must not add non-linear effort and avoid redundancies



## Trust & Privacy

Supply chains include distrusting, privacy focussed participants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# Step 1: We achieved these goals with a symmetric chain traversal

Ownership: Symmetric Chain Traversal

## Blockchain

**Producer** (Address) → **Product / Batch** (Smart ContrCACT) → **Dealer** (Address) → **Customer** (Address)

## Supply Chain

**Contract Manufacturer** → **Product / Batch (Physical)** → **Dealer** → **Customer**


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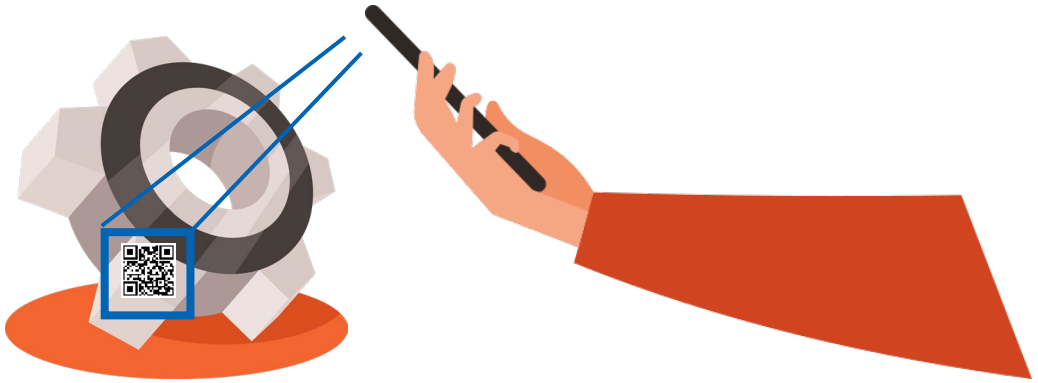
# An additional uniqueness is that, the users scans the QR code and the surrounding material

## The Customer Experience

- Verify Dealer as Owner
- Verify Originality of Product
- Log Batch / Product Actions



**Queries (& Writes)**

Customer → Product / Batch (Smart Contract)

Application of the verification algorithms

- NFC: Encryption algorithms
- Optical: Compares image information result of the verification request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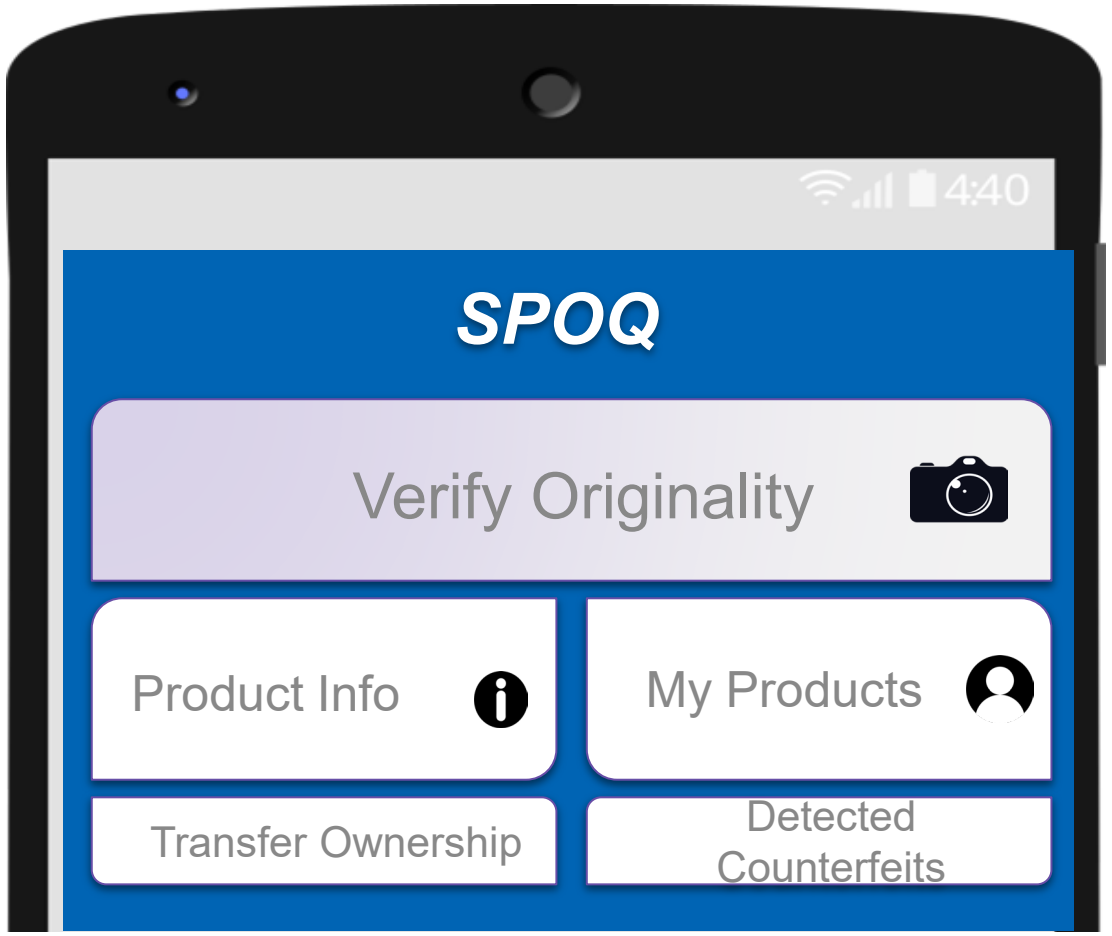
# A standalone app or an integrated feature in an existing enterprise app empowers customers





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# The producer and dealer experience are designed to generate security and useability / operationality

## Producer Experience

- Attach Unique Product / Batch Identifier
- Store Information in Distributed Storage
- Create Smart Contract
- Pass on Ownership

## Dealer Experience

- Verify Originality of Product Batches
- Split Batches
- Pass on Ownership
- Log Batch / Product Actions

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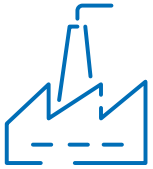
# A clear and simple verification model has been developed

## Producer



Trusts product (possibly produced by Contract Manufacturer)

Producer trusts buyer if the latter can prove possession of original product

## Data Storage

Accepts all data published by consortium members and product owners

## Blockchain

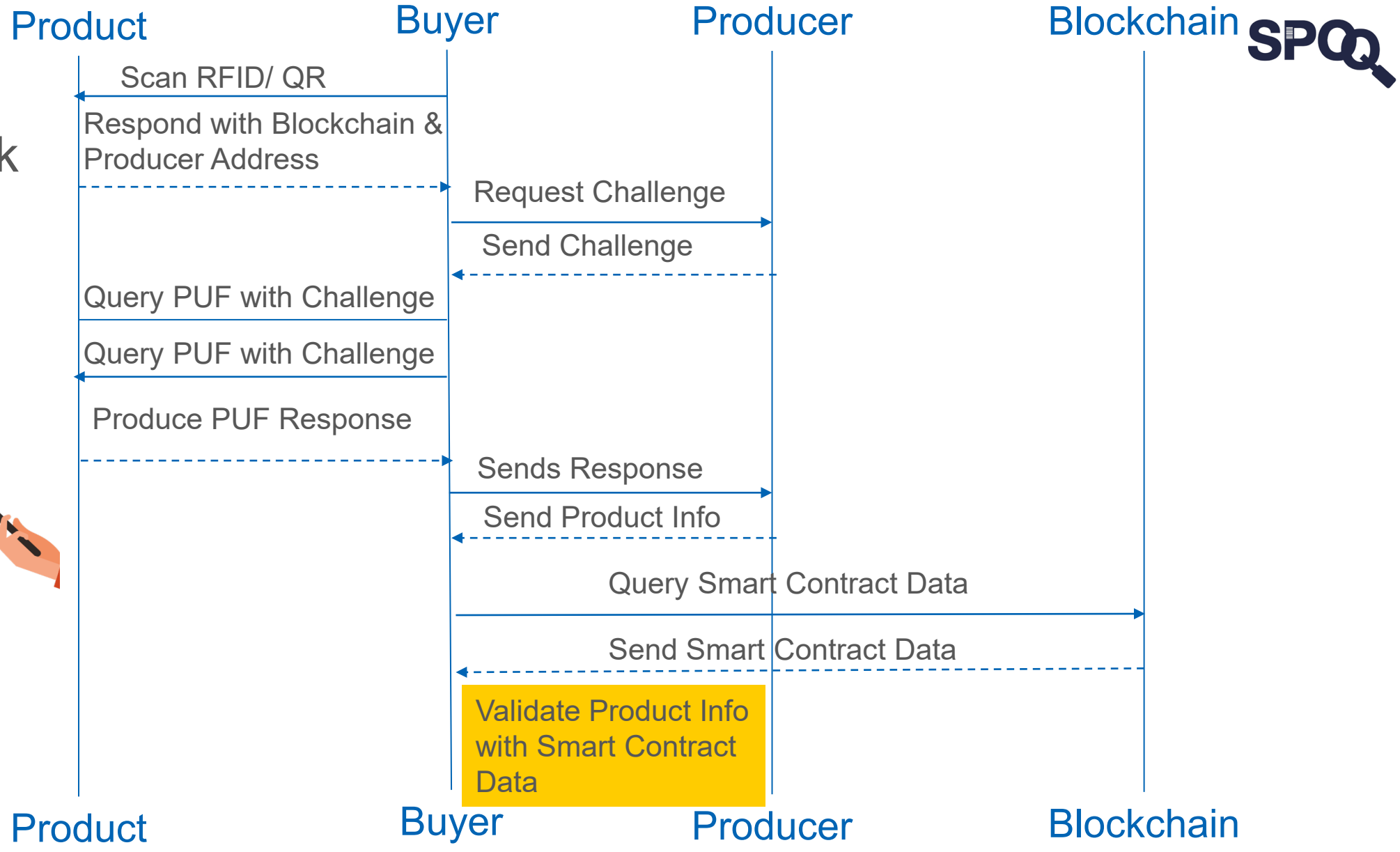
Accepts all data published by consortium members Contracts accept all data published by contract owners

Blockchain stores hashes of data in storage.
No direct connection, hence no direct mutual trust required

## Buyer

Buyer trusts the app (SPOQ App), product information on blockchain if it is signed by producer. There is limited trust for information from previous owners of the product

# Verfication Strong & Weak PUFS



# To achieve our goals we use the following core technical elements

- Blockchain: *Quorum / **Ethereum***
  - Quorum is Ethereum based
  - Permissioned (write access is restricted)
  - In Quorum, Ethereum is exchangeable with Hyperledger Besu
- Distributed Storage:
  - *Interplanetary Filesystem (**IPFS**)*
  - *Tessera (Quorum compatible)*
- Client Implementation: ***Golang***
  - Same language as used by Blockchains and IPFS
  - Portable to Mobile Apps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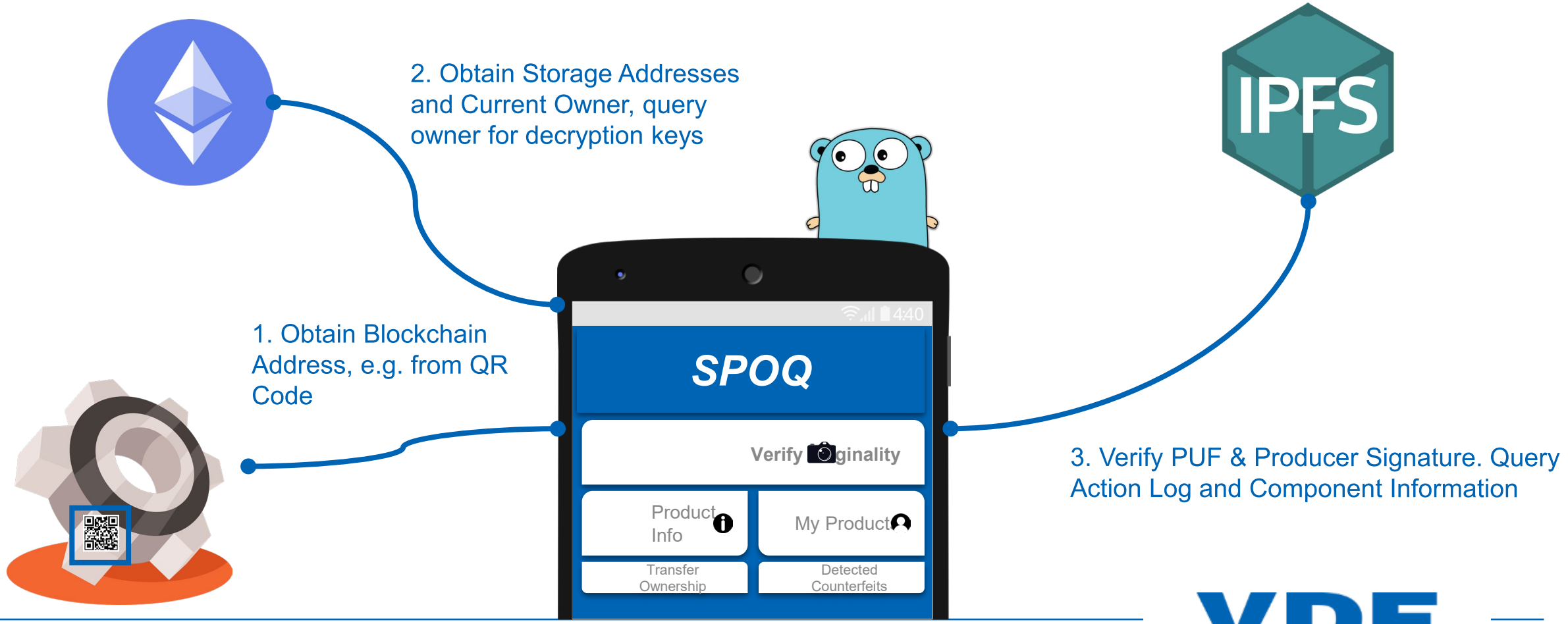
# The current state of our demonstrator meets the market needs.



# The Konsortium

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# Questions & Comments

# Contact Us

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# THANK YOU!