An open Digital Product Passport ecosystem with GS1

GS1 Netherlands

In this presentation:

- About GS1
- What is a Digital Product Passport?
- GS1 vision on Digital Product Passports
- What does a generic DPP solution look like?
- Components in a DPP framework
- Using GS1 identifiers
- Non-GS1 identifiers & interoperability
- Putting it all together

GS1 Netherlands

About GS1

- **Not-for-profit** and neutral
- Open standards, identifiers, services
- Governed by our members
- **2 million member companies** worldwide
- **116** GS1 organisations, in 150 countries
- **10 billion barcodes** scanned every day

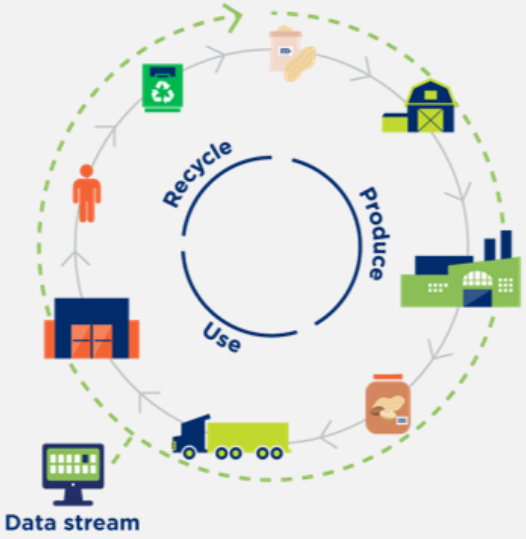
50 years ago: introduction of the **barcode (EAN/UPC/GTIN)**

GS1 Netherlands

Helping in the transition from linear to circular

Linear product value chain

Sustainable, circular product ecosystem



Data sharing on a (serialised) product level

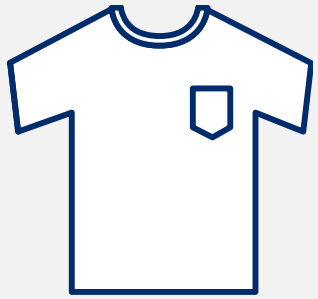
GS1 Netherlands

What is a Digital Product Passport (DPP)?

- The **Digital Product Passport** is a component of the EU Eco-Design for Sustainable Products Regulation (ESPR). Part of the **'new Green Deal'**
- **Economic Operator** is responsible
- Data is to be **decentralized** at the EO, with a **centralized registry** of DPPs
- Requirements will differ per product category - defined in **Delegated Acts**, with the first becoming mandatory in **2027**
- DPPs must use **open standards**, **interoperable** formats & be **machine readable**

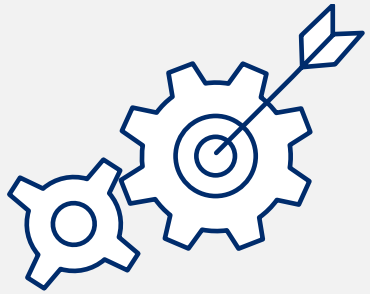
GS1 Netherlands

GS1 Vision on DPP - context

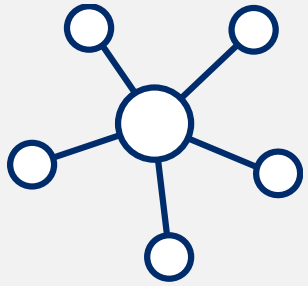


DPP requirements will **vary per product category**, but likely involve many actors along the supply chain

DPP requirements will remain **fluid**, still many unknowns



Companies have **different** IT architecture & capabilities, investment capacity and goals



IT development is rapidly moving toward more **fluid orchestration** of internal and external functionality (composable architectures)

In short, quite a bit of chaos… but with enough known factors to get started

GS1 Netherlands

GS1 Vision on DPP - implementation

- We believe most DPP implementations will be composed of **multiple components from multiple parties**
- As the landscape matures, we expect to see **different types of building blocks for different types of products** – interoperable with one another in a living, growing ecosystem
- An example of this are **different identifiers**, such as GTIN and DID-based identifiers (see CIRPASS)
- **Interoperability** and the use of **standards** will therefore be key factors in implementation
- GS1 aims to deliver some of those components – **'building blocks'** – to parties creating DPP solutions
- We design these building blocks - **standards, identifiers or functionality -** so that they can be **combined or used separately**
- **GS1 does not deliver** bespoke **end-to-end solutions** - we do not compete with 3rd party solution providers, they can use GS1 building blocks in their solutions

What does a generic DPP solution look like?

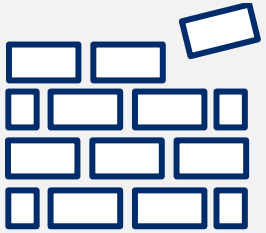
Identifier **Carrier** **Data** **Display**

Despite their differences, all DPP's will have at least the following basic components in common:

- an **identifier**
- a **carrier**
- the associated **data**
- a way to **display** that data

GS1 Netherlands

GS1 building blocks for a DPP solution
The product will need to be identified



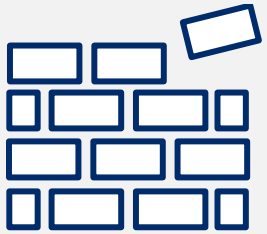
Identifier | **Carrier** | **Data** | **Display**

Identification can be at the **model** level (master product data), or in more detail at the **batch** (lot) level, or even at the **item** level (individual serial number). This is determined by the relevant Delegated Act for that product. **Locations** may need to be identified as well.

GS1 Digital Link with product (GTIN) and location (GLN) identifier

GS1 Netherlands

GS1 building blocks for a DPP solution
The identifier needs to be present on the physical product



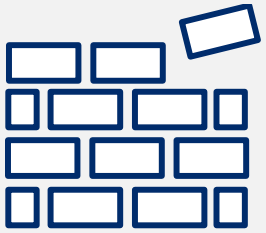
Identifier | **Carrier** | **Data** | **Display**

The identifier needs to be present on the physical product in some way, so that it can be scanned by a user and **linked** to the underlying data. This is done by a *carrier*.
The **carrier** should be a visually **scannable** one like a **QR code** or watermark.
The identifier should be able to be **resolved** into the DPP (web)location(s).

GS1 can provide a QR code/Data Matrix and resolver

GS1 Netherlands

GS1 building blocks for a DPP solution
It must contain data about the product



Identifier | **Carrier** | **Data** | **Display**

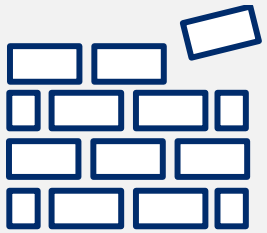
The DPP must contain **data about the product**, at minimum the data as described in the relevant **Delegated Act**. *This will vary per product category*.

Again, data can be at the model/batch/item level. It may include not only data from its **production** (such as materials), but also from its **lifecycle** (such as a repair event).

GS1 can serve as the hub to all connected data
GS1 has open standards for product data and event data

GS1 Netherlands

GS1 building blocks for a DPP solution
Data needs to be visualized



Identifier

Carrier

Data

Display

Finally, once all relevant data is linked, it needs to be **visualized** (displayed) to the user.

This can be done via a webapplication.

We expect most Economic Operators want to provide this under their own brand.

Why use a GS1 GTIN-based DPP identifier?

The simple answer: *because most consumer products already have one already used across the supply chain*

- The QR Code powered by GS1 will be on the product anyway for non-DPP usage
- Single QR code to provide all functions you may want (price/DPP/marketing/loyalty, etc)
- No additional identifiers to administer
- No additional costs
- Does not confuse consumers

On a technical level, the GTIN/GS1 Digital Link is:

- An open standard
- Explicitly mentioned as compliant in the ESPR regulation itself (Annex III c)
- Able to handle all levels of data (model/batch/serial)
- Can connect multiple underlying targets, as long as they are web-accessible
- Available right now

GS1 Netherlands

Non-GS1 identifiers & interoperability with GS1

Why would you use non-GS1 identifiers for DPP?

- For product categories that exist outside of GS1 ecosystems
- If self-sovereignty of the data is desirable (e.g. high-cost items)

Can you use GS1 building blocks & non-GS1 identifiers interoperably?

- Absolutely!
- GS1 Digital Link allows non-GS1 identifiers to be incorporated
- Anything that can be expressed as a URI (such as a DID) can be the target of a GS1 LinkType
- In this context think of things like Verifiable Credentials for certificates etc.

Putting it all together with a GS1 Digital Link

Product

Identified by

Identifier

GS1 Digital Link with
GTIN + serial, batch,..

Encoded in

QR code

Scanned by

Mobile device

Calls

GS1 Resolver

Resolves to

DIGITAL PRODUCT PASSPORT

Links

GS1 Links registry

Certificates

Events

Sustainability data

Instructions

Master Data

GS1 Netherlands

Summary

Example

- GS1 is a globally active, not-for-profit organisation that creates open standards and issues globally unique identifiers to over 2 million member-companies
- The Digital Product Passport is a part of the European New Green Deal for a circular economy
- While DPP regulation is not fully defined yet, we know enough to get started
- GS1 offers an existing open ecosystem with building blocks to facilitate creating DPP solutions to all parties
- GS1 DPP building blocks such as the GTIN and QR code are available, and already in use for most consumer products
- If you want to discuss this further or have question, contact info@gs1.nl and reference 'ECP presentation'

GS1 Netherlands

Thanks!