

GS1 Digital Link | Whitepaper

GS1 Digital Link – One for All

A single code with a lot of information:
the new standardized GS1 Digital Link has it all.



1. Introduction

1974. The global economy is reeling from the oil crisis, Germany wins the World Cup and the new Swedish band ABBA tops the Eurovision Song Contest with a song called "Waterloo". And something else happened in 1974: in an American supermarket, a packet of chewing gum was scanned at the checkout – for the first time in the world a barcode was used to pay for an item in a shop.

We've now been electronically scanning things like this for 46 years, and in impressive quantities: today over 100 million products globally are identified by standardised barcodes, and more than 6 billion items every day are scanned at supermarket checkouts.



PAST
FROM 1974



FUTURE
FROM 2021

But as was the case 46 years ago, each barcode just contains a simple sequence of numbers which makes the relevant product identifiable according to global standards. Barcodes lack another dimension, literally, needed to satisfy the modern demands of the consumer goods industry and its customers. Current standard barcodes won't much longer be able to meet the ever-growing demands for digital information and interactions in the relationships amongst producers, retailers and customers.

The solution is right there – two-dimensional codes (QR or datamatrix) and electronic tags (based on NFC or RFID) can already replace one-dimensional codes in all of their functions, and in addition cover a variety of digitally linked processes within the entire life cycle of products, from production, logistics and retail to customer usage and recycling. All that's needed is a new universal standard, like the one which helped the original barcode on its march to victory.

2. GS1 Digital Link – the GS1 standard for digital transformation

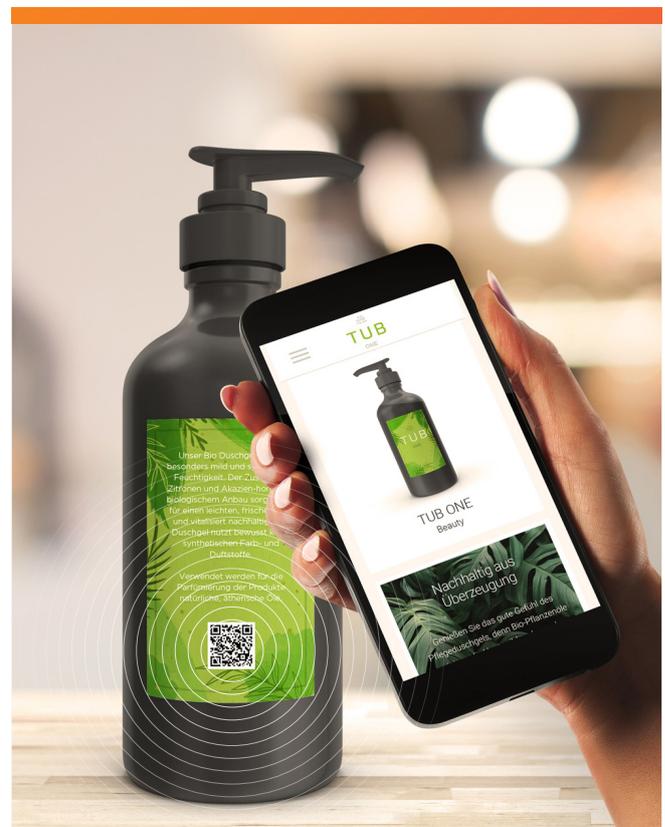
GS1 Digital Link, developed by GS1, is the standardised solution for digital product IDs, and combines existing GS1 standards in a new universal code.

Manufacturers and retailers can continue to use their established GS1 codes: however, GS1 Digital Link will make these codes web-capable and, for the first time, allow them to be used by customers – globally.

2.1. Digital profiles for each physical product

The identification and labelling of physical products in the consumer goods industry must and will change to enable comprehensive digital transformation. The new GS1 Digital Link standard will change billions of barcodes on consumer goods, creating a place for them in the digital world.

The new standard will allow each and every physical product to be connected via a standardised URI syntax to a digital twin – a digital profile in the virtual world, linked by a single ID on the product label.



Based on proven GS1 standards:

all consumer goods will be web-enabled. More and more processes along the whole value chain between production, logistics, and retail will be linked with innovative digital services – even directly enabled consumer interactions.

3. New standards for complex challenges

The global consumer goods industry is currently subject to enormous pressure to change. Established business models and distribution channels are facing disruptive upheavals. The catalysts include digitalisation, regulation, sustainability, growth limits, customer retention, market shares and cost efficiency, to name a few.

In many cases, manufacturers and retailers are tackling these complex challenges with long-redundant tools:

- conventional barcodes with non-web-capable IDs
- supply chain processes distributed along separate, closed IT systems
- incomplete data in logistics and distribution
- interactive opportunities for customers based on untrustworthy information

3.1. Uniform solutions

GS1 Digital provides a uniform solution for all the problems mentioned above. The product links all business departments and processes.

The standardised labelling on the product optimises and facilitates the digitalisation of the entire supply chain.

Even innovative digital solutions up to and including secure, direct interaction with the customer are possible.



3.2. Practical application

Implementation means that every single item of consumer goods gets its own digital identity on the internet: GS1 Digital Link has a reliable internet address which can be read and used by all IT systems and digital end-user devices. GS1 Digital Link is encoded in a barcode on the product's packaging or label, and in this way it is connected – and inseparably linked – to the item through its entire life cycle.

The GS1 Digital Link standard thereby establishes for the first time uniform, trustworthy product information for all partners along the supply chain (B2B), as well as for communication with the end customer (B2C) if the trademark owner makes this information and these services available.

4. Connected benefits

GS1 Digital Link has clear benefits compared to standard, proprietary and non-web-connected item labels:

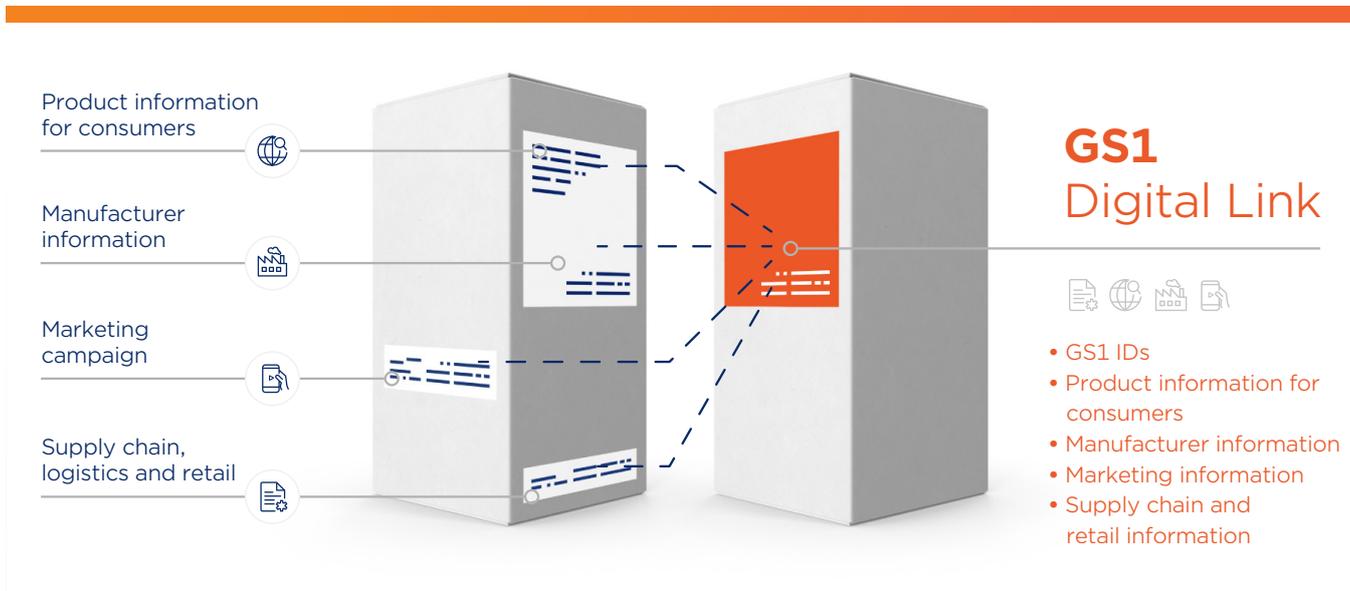
 **interoperability**

 **internet capability**

 **dynamic connectivity**

 **uniqueness**

Benefit	Effect
 Interoperability Existing item codes remain valid and are unified in GS1 Digital Link.	Migration to GS1 Digital Link can be conducted without drastic changes being required to existing systems and processes.
 Internet capability A reliable, web-enabled ID for every item.	GS1 standard applications become internet-capable.
 Dynamic connectivity Connecting data and processes in supply chains and retail – and for customers.	The same code can provide every participant with the right information at the right time – for operational excellence in B2B and customer experiences in B2C.
 Uniqueness Central records for all events in the product's life cycle, unique to the item (allowing for serialisation).	Source for reliable, granular data for the optimisation of products, supply chains and customer experience.



4.1. Superpower: serialisation

In order to unlock the benefits of uniqueness, we use the superpower of serialisation.

Serialisation allows every individual item produced to be precisely identifiable. In addition to the article number, serial numbers are assigned and used to register articles in production batches, pallets, boxes, orders or commissions.

All track and trace data and personal interactions an individual consumer goods article creates on its way from production to the end customer can be recorded and saved. These data form the basis for unique applications, analyses and the optimisation of product cycles and business processes.

5. Web meets GS1 – Two GS1 Digital Link examples

A conventional barcode with the GTIN 9506000134369 can be directly embedded in an internet address:

```
https://id.gs1.org/01/09506000134369
```

or

```
https://dalgiardino.com/01/09506000134369
```

In the first version of the GS1 Digital Link, a standardised GS1 service (resolver) is used to forward the GS1 Digital Link to the provider, and in the second, the provider themselves runs the resolver for forwarding the GS1 Digital Link. GS1 provides free access to the documentation for the GS1 Digital Link resolver. GS1 Germany's solution partners offer resolver services on an easy-to-integrate cloud platform.

In the second example, several different sets of data content are connected in the GS1 Digital Link:

```
https://id.gs1.org/01/09506000134376/10/ABC/21/123456?17=211200
```

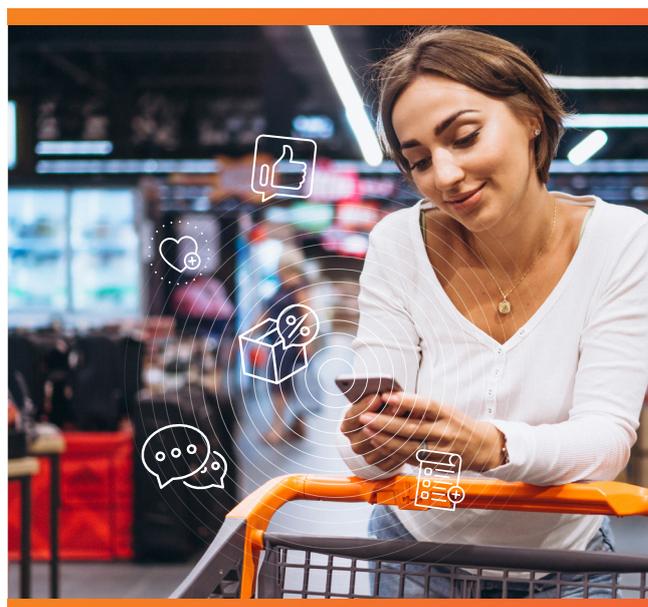
BATCH/LOT SERIENNUMMER ABLAUFDATUM GTIN

or

```
https://dalgiardino.com/01/09506000134376/10/ABC/21/123456?17=211200
```

BATCH/LOT SERIENNUMMER ABLAUFDATUM GTIN

Embedded here are the GTIN 09506000134376, the expiry date 01.12.2021, the batch number ABC and the serial number 123456.



6. Make room! – on labels and packaging

A lot of different information competes for the limited space available on packaging and labels. Most of this is neither useful for nor needed by the end customer.

Typical packaging is covered with densely-packed product information, ingredients, application tips, regulatory notices, article numbers, serial numbers, barcodes for retail and logistics, inspection codes and QR codes for marketing promotions: all of this confuses the target group and diminishes the brand experience.

6.1. Now just one code on the packaging

These issues can be solved in future with a single two-dimensional GS1 Digital Link code on the packaging. Depending on who reads the code, the nature of the information and interaction the code returns will change, thanks to the GS1 Digital Link type: logistics partners see the target location, retailers see the inventory, and customers with a smartphone see the current marketing promotion.

This renders other barcodes redundant because their information, including those of proprietary codes, can be embedded in the GS1 Digital Link.

6.2. Product and packaging as a touchpoint for the end customer

In addition, all the “small print” for end customers which is not necessarily required by law to be printed on the packaging can be published instead on the website, which is permanently linked to the QR code.

In addition to product information, mobile websites can of course also offer many other opportunities for new digital customer experiences, which, thanks to the GS1 Digital Link, can grab the customer’s attention at the right moment with the right combination of information and interaction.

7. B2C benefits

GS1 Digital Link is the article code that customers can also trust

The GS1 Digital Link reveals its outstanding benefits when it comes to the connection between brands and their end customers:



proven increase of brand loyalty, consumer acceptance and recoverability in comparison with non-smart products



more transparency, more consumer protection and so more customer trust, thanks to increased access to information about origins and supply chains



support for brick and mortar retail outlets due to new shopping experiences and stronger incentives



cost-efficient fulfilment of regulatory requirements



strengthening trademark protection and decreasing risks to a brand’s reputation



minimising profit loss due to product piracy

With the GS1 Digital Link, the product itself becomes the touchpoint for marketing communication and customer retention. Brand producers and retailers can now also access decisive competitive advantages – for example, targeted and individualised communication with end customers – when they use serialised products with the GS1 Digital Link.

8. Moving to GS1 Digital Link

We advise our customers during the planning phase of moving to GS1 Digital Link:

1. How can we create digital identities for products?
2. How can we print and code the GS1 Digital Link code on packaging and labels (as a QR code, NFC or RFID)?
3. How can we connect the GS1 Digital Link code to applications used by supply chains, logistics, retailers and end customers?
4. How can we gather and analyse the fresh data?