The Global Language of Business

GS1 Digital Link
GS1 US® Implementation Guide

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GS1 US®, a member of GS1 global, is a not-for-profit information standards organization that facilitates industry collaboration to help improve supply chain visibility and efficiency through the use of GS1 Standards, the most widely-used supply chain standards system in the world. Nearly 300,000 businesses in 25 industries rely on GS1 US for trading-partner collaboration that optimizes their supply chains, drives cost performance and revenue growth while also enabling regulatory compliance. They achieve these benefits through solutions based on GS1 global unique numbering and identification systems, barcodes, Electronic Product Code (EPC®)-based RFID, data synchronization, and electronic information exchange. GS1 US also manages the United Nations Standard Products and Services Code® (UNSPSC®).

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1 Executive Summary

The GS1 Digital Link standard extends the power and flexibility of GS1 identifiers by making them part of the web. This means that GS1 identifiers, such as the GTIN, are now a gateway to consumer information that strengthens brand loyalty, improved supply chain traceability information, business partner APIs, and more. GS1 Digital Link helps barcodes and other data carriers become web links - connecting a product's unique identity to online sources of real-time information that brands control.

GS1 Digital Link is a method by which a range of specific business objectives may be achieved:

- one machine readable data carrier (i.e., barcode, RFID tag) can perform multiple functions, reducing the need to add further data carriers to any item;
- simpler data sharing for B2B and B2C tasks.

The technologies and standards that underpin the World Wide Web and the GS1 System are mature and well-proven. Solutions already exist that perform many of the tasks for which GS1 Digital Link is well-suited. However, only GS1 Digital Link is suitable for so many tasks while being based on open standards that promote interoperability across solutions.

There are several different components to the system:

- the syntax, the structure of a GS1 Digital Link Web URI allows complete interchangeability between the GS1 element string syntax and a URL;
- link types, the machine-readable labels attached to links that radiate out from an identified item and provide a virtual navigation menu;
- resolvers that store and activate links, providing the physical means through which any number of resources can be accessed, starting from the identified item to which they relate.

GS1 Digital Link does not need to be implemented as a big, single project, but can be implemented incrementally. Initial changes can be made at zero cost that lay the foundation for future developments that provide simple and more cost-effective routes to meeting more sophisticated demands in the future.

2 The purpose of this document

This GS1 Digital Link GS1 US® Implementation Guide provides guidance for retailers, brand owners, healthcare providers, and solution providers regarding implementations that can leverage GS1 Digital Link. It is not a substitute for the standard itself, which is where you will find full technical details. The GS1 General Specifications is the normative reference for details on data carrier options and application use. A basic familiarity with the kind of things that GS1 Digital Link can do is assumed.

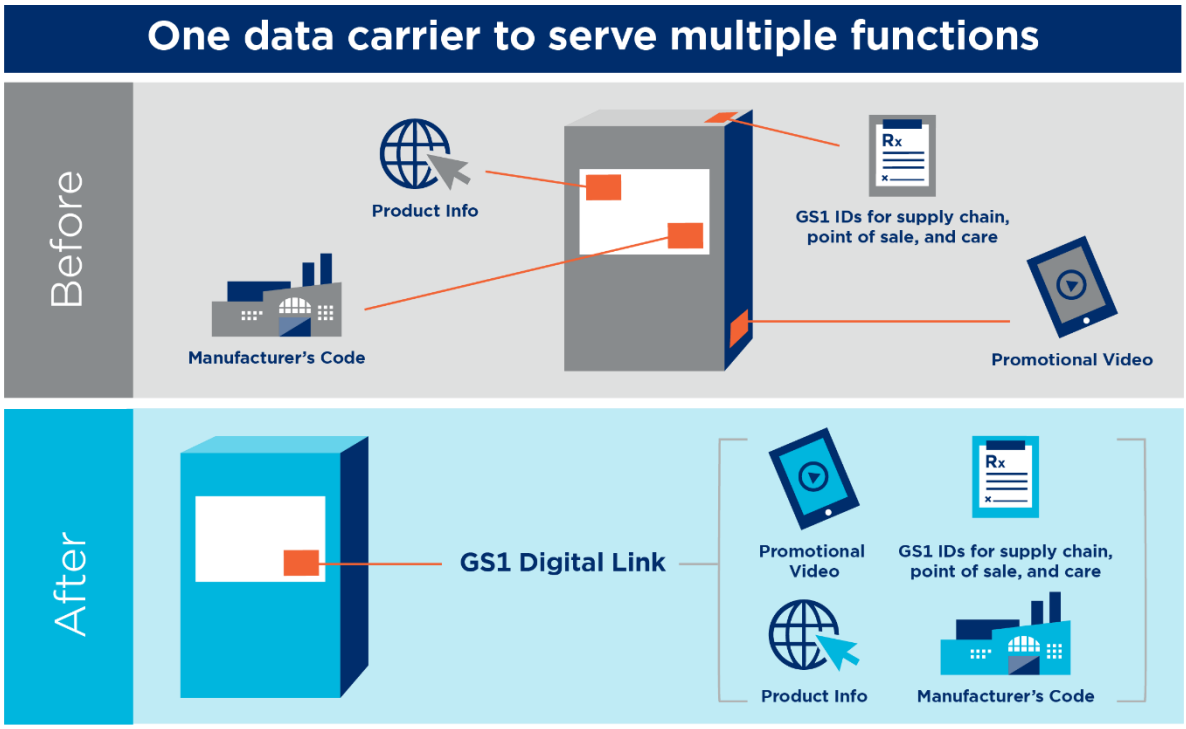
3 Introduction

GS1 Digital Link has the opportunity to transform the way in which data concerning products, shipments, companies, locations, and assets passes between business partners, consumers, clinicians, and more. GS1 Digital Link labelling can become a more efficient, empowering platform that enables limitless linked information, reduced data latency, and more. GS1 Digital Link provides the ability to encode additional detail about a product that can then be used to serve up richer product experiences for brands, retailers, AND consumers. It is completely independent of any data carrier and has the potential to work with all barcodes as well as with RFID (UHF/RAIN, NFC), and other data carriers that do not require a line of sight to be scanned.

GS1 Digital Link has the potential to deliver a single line-of-sight barcode per product/pack that can provide value to consumers, retailers, and brands. There are equally exciting opportunities for GS1 identifiers such as those for locations, assets, and shipping units, too, but this guide focuses particularly on trade items.

3.1 The benefits and value proposition of GS1 Digital Link

3.1.1 Multi-functional data carriers

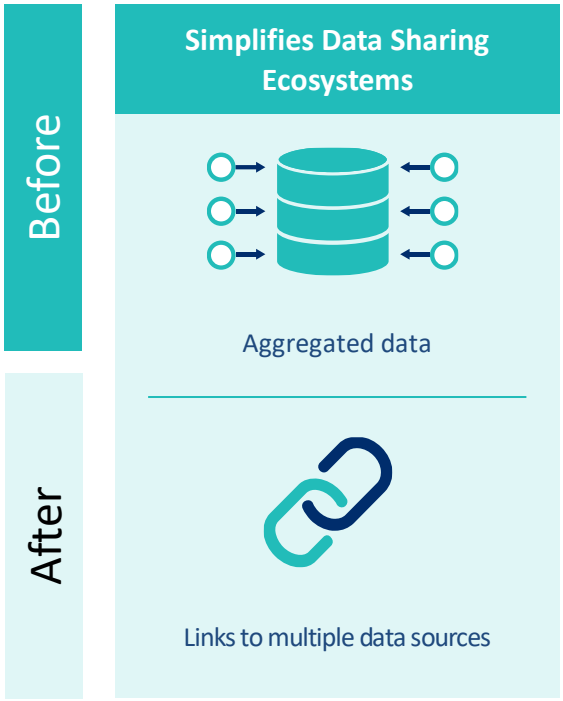


It is increasingly common to see multiple data carriers on a single item. This is because each one is placed there for a single purpose such as supply chain operations, point-of-sale (POS), extended consumer information and promotional interaction. This takes up a lot of space on-pack and confuses consumers, staff, and scanners. In some situations, such as a hospital operating theater, confusion about which code should be scanned can have serious consequences.

GS1 Digital Link enables a **single** code to perform **multiple** functions, both online and offline, reducing the need for multiple codes on-pack and has the future potential to realize a single data carrier for all functions.

These benefits are explored in more detail in section *4.3*

3.1.2 Simpler data sharing



Barcodes and other data carriers have always been a reference to data about the identified object stored in a computer. Traditionally, this was limited to data stored specifically in the computer or computing infrastructure to which the scanner was attached.

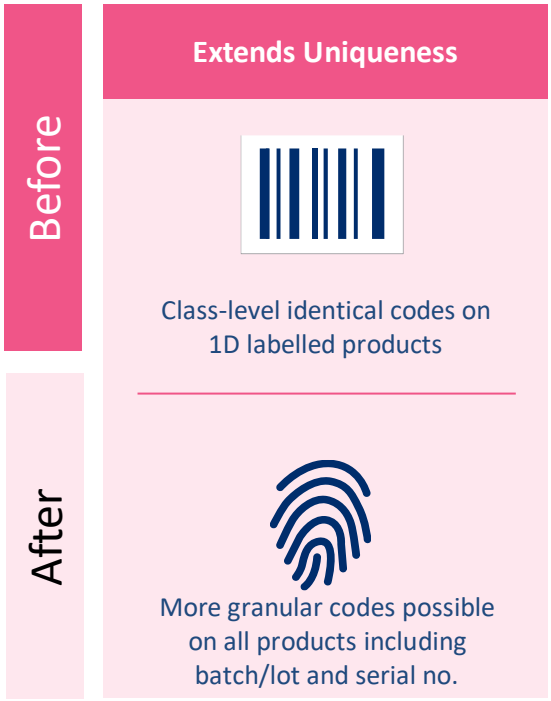
It is common for manufacturers to have to aggregate data, that is, make a local copy of some combination of: master data (e.g., communicated through the Global Data Synchronization Network™ [GDSN]); data managed by other business partners including supplier traceability info; information made available for regulators; information for customers (websites, apps); multimedia assets created and managed by marketing agency or agencies.

That usually means that data must be harmonized in some way and managed according to a single process. It can be a full-time task – even several peoples' full-time task – to manage aggregated data and to keep it up to date.

GS1 Digital Link connects identified items to limitless sources of data, whether stored locally or remotely, whoever they are curated by, enabling many new possibilities in addition to the data carrier's current role in supply chain and POS tasks.

The GS1 Digital Link URI syntax provides a *common API* for multiple points on the Web making it easy to query different sources for information about the same item. For example, a retailer will provide information about their offer compared with the brand owner whose focus will be on the product.

3.1.3 Granular identification



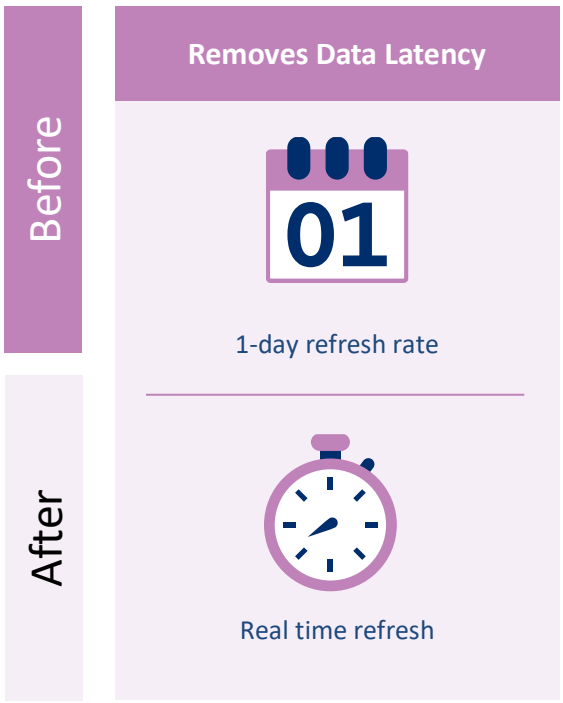
The EAN/UPC barcode has served industry well since 1974, but it only offers class-level identification. This means that the EAN/UPC can only identify a specific trade item without information about the particular batch or individual instance of that trade item. There is a growing demand for more data to be encoded in the data carrier such as the batch/lot, expiry date, measured weight and, in some cases, individual item level identification through serialization.

GS1 Digital Link is applicable at all levels of identification including batch/lot and serialized level.

Such identification is possible using GS1 Digital Link without having to make an online lookup, even if the identifiers are encoded in the data carrier as a Web address.

GS1 Digital Link can be used with any data carrier, however, those that typically encode a URL, such as QR Code, NFC or Data Matrix, are a more natural fit. At this time, the only data carriers approved for open use with consumer mobile device applications are QR Code and Data Matrix. See FAQ in 6.

3.1.4 Reduced latency



When data is copied and aggregated, there is almost always a delay between the facts on the ground changing and copies of the data being updated. This inherent latency can mean that important updates to the data on which a business depends are not reflected with due speed.

GS1 Digital Link avoids the need for data aggregation and simply points to the original source data, latency is eliminated.

4 Overview

4.1 The Dal Giardino brand

This implementation guide makes extensive use of the 'Dal Giardino' brand. This is an entirely fictitious brand name. It was created originally by SGK/Schawk to support the development of the *GS1 Mobile Ready Hero Images Guideline* but has been re-used here. The website at *dalgiardino.com* exists purely to exemplify different features of GS1 Digital Link.

4.2 The id.gs1.org domain name

This guide includes a number of examples. To make sure they function as described, we have used the id.gs1.org domain name, at which the examples are established. However, this should not be taken to mean that GS1 Digital Link only works on this specific domain. The establishment of a network of such services by the user community is expected and encouraged. The id.gs1.org service was originally set up as a test bed before being integrated into GS1's Data Services suite but has no formal role distinct from any other service.

4.3 What is GS1 Digital Link?

GS1 has created a global business language based on unique and unambiguous identification encoded in data carriers including barcodes and RFID tags, and the communication of data essential for business processes that rely on those identifiers. These fundamentals are key for enabling efficiencies in processing of goods and services and are used all around the world to support supply chain partners' various business needs.

The World Wide Web is an environment where people as well as companies can access or share information on anything. This of course, includes interacting with products and services.

GS1 Digital Link provides the bridge needed to connect GS1-based identification schemes with the syntax used on the World Wide Web. In simple terms, GS1 Digital Link provides a standard way of expressing GS1 keys and attribute data in a format that can be used on the Web.

The GS1 Digital Link Standard defines how to structure web URIs to include further information (e.g., batch/lot, expiration date, serial number, etc.) as well as other GS1 keys such as GLN (Global Location Number), SSCC (Serial Shipping Container Code), etc.

Note: *Any* valid combination of GS1 element strings, as defined in section 4.14 of the GS1 General Specifications, can be encoded in a GS1 Digital Link URI.

For example, given a GS1 Digital Link URI such as:

https://dalgiardino.com/01/09506000134352/10/ABC

we can easily extract and express the same information using GS1 element string syntax:

(01)09506000134352(10)ABC

4.4 How one data carrier performs multiple functions

There are many factors that will affect a manufacturer's choice of data carrier. These include things like:

- Printing capabilities such as speed and quality
- Data capacity
- Need for product authentication
- Installed equipment base
- Intended use by business partners/fellow clinicians etc.
- Intended use by consumers/patients
- Visual appearance, available area on-pack
- More…

This implementation guide does not provide direct guidance on data carrier choice. For information on data carrier selection, see:

- GS1 General Specifications *Figure 5.12.3.1 3. Symbol specification table 1 addendum 2 for GS1 Digital Link* – approved barcodes, size, and quality specifications
- *GS1 US Advanced Data Carriers at Point-of-Sale Getting Started Guide*

An important feature of GS1 Digital Link is that one barcode can perform multiple functions. It is not necessary to add a new barcode every time there is a new use case. Other types of data carriers may be needed to meet some needs, such as RFID for non-line-of-sight use cases.

Being able to use the same data carrier for multiple functions has many benefits:

1. Less space on-pack is taken up by barcodes and other symbols, leaving more space under the control of the brand designers.
2. Consumers are less confused by multiple data carriers.
3. The likelihood is reduced of a scan failing due to one data carrier interfering with another.
4. In healthcare, the presence of a single data carrier ensures that important clinical decisions are not made on the basis of the wrong barcode being scanned.
5. The primary purpose of the data carrier – to identify the item in this case – is left intact and is not compromised by being associated with data that may or may not be up to date.
6. Data carriers that *only* serve a short-term aim, such as linking to a promotion, are likely to become out of date very rapidly. GS1 Digital Link allows real time updates to information accessed from a persistent identifier printed on-pack.
7. Some information can be retrieved using multiple applications with no need for mobile phone users to install a specific app for the purpose.

Before you consider adding another data carrier to your product, especially for a single-function, consider whether your existing on-pack data carrier can be used without modification.

A barcode or other data carrier can be made multi-functional using simple web technology. All that is needed is to arrange for links to be established *from* the identified item to things like:

- Product information
- Instructions

- Spares and accessories
- Use ideas (recipes, designs)
- User forums/feedback
- Registration
- Product authentication
- Traceability
- Social media (online 'social shopping')

This is what GS1 Digital Link achieves. As GS1 Digital Link is using web technologies, the information can be tailored to the end user according to factors such as purchase history, language, location and whether the customer is known (logged in) or not.

4.4.1 Link types

Scanning a barcode or NFC tag with a mobile phone or device and being taken to a product information page is easy and offered in many apps available today. Likewise, scanning a code and being taken to a promotional page is easy. But these are single use codes which leads to the proliferation of codes on-pack.

For it to be possible to use **one** data carrier for **multiple** purposes, there needs to be some sort of way-finding service. A means to 'ask for directions' to a particular type of content.

That is the job of the **link types**. That is, the labels that are applied to links so that a human or a computer application can see which link to follow to find a particular thing. They perform the same role as menu options on a website.

Think of a typical online retailer. You will see things like a search box, a login link, categories of items for sale, information about delivery options, an option to checkout, view previous orders, an add to basket button and so on. These are common and therefore widely understood.

Link types (short for link relation types) are both human and machine-actionable – and that is what enables different apps to access different information.

GS1 defines its *set of link types* as part of the *Web Vocabulary* (for which the usual prefix is gs1:). This list is under continuous review with change control under the *Global Master Data SMG* under GSMP but at the time of writing, examples include:

Link type examples	
gs1:pip (product information page)	gs1:hasRetailers
gs1:ePIL (electronic patient information leaflet)	gs1:instructions
gs1:traceability	gs1:safetyInfo
gs1:recallStatus	gs1:review

It is possible to think of link types as forming a standard API for all items identified using GS1 identifiers.

The table below shows some examples for a fictitious Dal Giardino product with GTIN 9506000134352

Link type	URL
Pip (product information page)	*https://dalgiardino.com/risotto-rice-with-mushrooms/*
recipeInfo	*https://dalgiardino.com/mushroom-squash-risotto/*
HasRetailers	*https://dalgiardino.com/where-to-buy/*
productSustainabilityInfo	*https://dalgiardino.com/about/*

Try this yourself – all of these links work:

https://id.gs1.org/01/9506000134352?linkType=pip
https://id.gs1.org/01/9506000134352?linkType=recipeInfo
https://id.gs1.org/01/9506000134352?linkType=hasRetailers
https://id.gs1.org/01/9506000134352?linkType=productSustainabilityInfo

In defining a set of link types, GS1 strikes a balance between the need for precision on the one hand – which suggests that we should define link types for every possible scenario in every possible detail - and the need to maximize interoperability on the other – which tends towards as few link types as possible.

When selecting a link type be sure to:

1. Look carefully at all the definitions in the list – do not just take the first one as there may be one better suited to your needs further down.
2. Note that the link type is defined for machine processing. The text that humans see can be set by the GS1 Company Prefix (GCP) owner, in any language, so there *is* a way to communicate in more detail what the link is to, beyond the link type itself.

For example, the link type 'instructions' can link to a video, a page of text, a set of diagrams etc. They are all 'instructions' to which you can apply human readable titles like "instruction video" or "instruction leaflet."

For clarity for any link, as well as the URL there is also associated metadata:

1. The link type
2. A human readable title
3. The human language of the target (following IETF BCP47 *Tags for Identifying Languages*)
4. The media type - HTML, JSON, XML etc. (using IANA-*registered media types*)

The first two are mandatory for GS1 Digital Link.

If you are sure there isn't a defined link type for your particular situation then additional terms can be defined through GS1's standards process (the web vocabulary is formally managed by the *Global Master Data SMG*). You can also define your own terms as set out in the GS1 Digital Link standard but be aware that it is unlikely that these will be interoperable outside your ecosystem.

5 Implementation Journeys

5.1 Maximizing existing B2C digital assets

(Fictional) Italian food manufacturer Dal Giardino has invested in developing a website to promote their products. The website includes:

- a separate page for each product including ingredients and allergen information;
- recipe ideas for their product range;
- information about the company, in particular the pride it takes in its corporate responsibility;
- links to their social media feeds;
- several videos that are hosted on a separate online platform.

In order to make this digital content available directly to consumers who may be in a store and considering purchasing a Dal Giardino product, they add a QR Code to each product that links to that product's information page.

5.1.1 Potential problems

This increasingly common scenario presents several potential problems:

- Adding an additional barcode to the pack takes up space on the product;
- The presence of multiple barcodes on-pack can cause interference at the scanner;
- Changes to the website may result in the URL in the QR Code to become obsolete leading to '404 Page not found'
- Pointing the QR Code directly to a short-term promotion is almost guaranteed to present consumers with out of date content in future.

5.1.2 How GS1 Digital Link can help today

Instead of using the URL of the Web page directly in the QR Code, Dal Giardino uses the GS1 Digital Link standard to create a *persistent URL* that contains the product's GTIN and that redirects automatically to the product's information page or can allow for the user to select where to navigate to from a list of options. This will work with QR Code readers, including the default camera on modern smartphones that remove the need to install any new app, hence significantly reducing friction for consumers.

Why do this today?

- The redirection from the persistent GS1 Digital Link URI can be updated at any time so that things like website updates and short-term promotions can all be handled easily with no change to the pack;
- This is a future-looking action;
- The persistent URL can be on the brand owner's own website or a third-party service.

You will need:

- A brand owner's website with a specific page per product.
- A webmaster able to configure the redirection (a standard feature of all Web servers) or the use of a resolver service
- A barcode/QR Code generator.

5.1.3 Linking to digital instructions and eLeaflets

There are a substantial number of benefits in being able to associate a physical product with digital information dealing with its proper use. With GS1 Digital Link link type *gs1:instructions*, consumers can access instructions related to an item's assembly, usage tips, and other pertinent details. Advantages of supplementing physical instructions with their digital counterparts include having the ability to update content real-time, offer chat support, provide instructional videos, allow for feedback, and enable users to adjust font and image size, as needed.

Within healthcare scenarios link type *gs1:epil* can be used for electronic patient information leaflets, or *eLeaflets.* It is often easier for a healthcare manufacturer to procure an external service to manage patient information than to manage the process in-house. In such a situation, the repository may or may not use the GTIN as an identifier for the item. If the leaflet repository does not include the GTIN in their database, talk to the solution provider and explore the feasibility of adding this in.

Ultimately, GS1 Digital Link relies on the data including a mapping from the GTIN to the patient information.

5.1.4 Adding granular identification

Dal Giardino sets up its production lines so that the GS1 Digital Link QR Code includes not only the product's GTIN but also the batch/lot number and expiry date. A feature in the GS1 Digital Link standard is that if no information is available for the specific batch/lot, information at the GTIN level is returned. Therefore, in this scenario, there is no effect on the consumer experience of scanning the QR Code but Dal Giardino is well set up for future use cases.

You will need:

- Barcode software able to generate GS1 Digital Link QR Codes within the production line.
- Digital printers downstream in the production environment (and associated QC tools to verify the data accuracy and quality of the QR Code)

5.1.5 Slightly more advanced

The redirection to the product's information page is augmented so that the batch/lot and expiry date information, present in the QR Code, can be processed dynamically by that product information page to present more specific information to the consumer.

This does not entail any software not already listed.

5.1.6 More advanced

Links to the recipe page, company information, social media feeds and videos can also be associated with the GS1 Digital Link URI so that they become readily discoverable by specialized apps. For example, a coeliac consumer will be able to use a specialized app to go directly to information about whether the product does or does not contain gluten.

You will need a resolver service to achieve this.

5.1.7 Future Opportunities

It is anticipated that in the future:

- point-of-sale scanners will recognize GS1 identifiers encoded as GS1 Digital Link URIs in QR Codes so that the existing barcode can be removed, freeing up package space;

- retail staff scanners will be able to make use of the more granular identification for things like product recall, first-in-first-out inventory checks and more.

5.2 Back of retail store operations

Many back of store operations depend on products being identified not just by the GTIN but also with details like the batch/lot number, or the expiry date in the data carrier as well. Either might be used to decide which batch to put on the shelf (first in first out), to identify a recalled batch, to prevent the sale of an expired item or to give a discount at POS for a near-expired item. These kinds of actions are possible without GS1 Digital Link since the key information can be in the data carrier such as a GS1 DataMatrix or a GS1-128. But they are all possible with GS1 Digital Link as well as:

- linking to hazardous materials (hazmat) information;
- triggering reordering processes;
- matching to a shelf label;
- etc.

Instead of a single use case, it is this "one barcode, many functions" that makes GS1 Digital Link so powerful. It is fully extensible and forward-looking in that you can add more functionality at any time.

5.2.1 How GS1 Digital Link can help today

Rather than centralizing data in one place, GS1 Digital Link works by redirecting requests to wherever the needed data is. This might be on the company intranet or elsewhere. That allows companies to set up and use discrete APIs and to link to them from a full variety of devices.

Different companies will have different priorities and so this can only be an example.

Dal Giardino receives product recall information from a variety of sources including its own internal quality assurance processes, government information, and consumers and retailers who report problems with specific batches of their products. It exposes this data through a simple API that returns true if the batch is recalled or false if not.

At a retailer's back of store, a staff member is about to restock the shop floor shelf with a Dal Giardino product. Before opening the case, they scan the barcode that contains the GTIN and batch/lot number of the product. The generic scanning app uses this information to send the request to the Web. The request is forwarded to Dal Giardino's recall API which returns false and so the retailer can unpack the case and add the contents to the shelf.

Later, a problem is reported to Dal Giardino and from that point on, the API will indicate that the batch has been recalled. This information is made available instantly so that if a customer tries to buy the recalled product before it's been removed from the shelf, the POS equipment can make the same call to the same API and get the up to date information, thus preventing the sale of a recalled item.

You will need:

- high capacity barcodes such as Data Matrix or a QR Code carrying a GS1 Digital Link URI;
- a generic scanning app;
- a resolver service.

Why do this now?

As we noted at the beginning of this use case, many problems can be solved by using more granular identification without using GS1 Digital Link. However, if we take the Dal Giardino recall status API as the first use case, it is easy then to add in, say, the FIFO use case, the hazmat use case and more. Putting that first use case into operation makes the subsequent uses progressively easier.

5.3 Solution provider options

It is not possible, nor is it desirable, to give definitive advice to solution providers about how to implement GS1 Digital Link. However, we can highlight some of the functions and requirements that a brand owner, retailer, transport company or hospital manager may be glad to outsource.

One of the assumptions that underlies GS1 Digital Link is that every product has a dedicated web page. Not all manufacturers/brand owners have this but if a consumer scans a GTIN then they will be expecting information about that specific item, not a page with multiple items of which that happens to be one.

The highest value product description pages will be both human and machine readable, the latter achieved using a combination of terms from schema.org and the *GS1 Web Vocabulary*. That immediately creates a mini knowledge graph with the product identifier that is printed on-pack as the way in.

Resolvers are relatively straightforward pieces of software. They comprise a web server and a database of links. The difficulty is in curating the links to related resources. Once done, though, the system is designed to make it easy for app developers to offer end users those links as a menu of options.

5.4 Product catalogs

Many organizations, including GS1 Member Organizations, operate product catalogs, traceability solutions, etc. By using the GS1 Digital Link syntax in the URLs for these services, or at least establishing URLs that redirect to them, service operators are putting in place a standardized interface that can be extended in future in whatever direction the operator so chooses. This can usually be done with minimal effort, providing an easy way to do something straight away that will give a degree of futureproofing for existing services.

6 FAQs

6.1 Do I have to use QR Codes to use GS1 Digital Link?

No. The GS1 Digital Link standard is completely agnostic about data carriers. 1D barcodes, DataMatrix, NFC, RFID, image watermarking and more are all technically usable with GS1 Digital Link URI syntax. The only data carriers currently approved for open use of GS1 Digital Link URI syntax with consumer mobile device applications are QR Code and Data Matrix.

For information on data carrier selection, see:

- GS1 General Specifications *Figure 5.12.3.1 3. Symbol specification table 1 addendum 2 for GS1 Digital Link* – approved barcodes, size, and quality specifications
- *GS1 US Advanced Data Carriers at Point-of-Sale Getting Started Guide*

6.2 How can a 1D barcode or DataMatrix be used with GS1 Digital Link?

The GS1 Standard specifies precisely how any valid set of GS1 element strings can be converted into a GS1 Digital Link and vice versa, that is, how the element strings can be extracted from a GS1 Digital Link. A set of GS1 element strings and a GS1 Digital Link are completely interchangeable.

(01)09506000134352(17)141100(10)PX8L(21)1BAAAA2BB3

The traditional GS1 element string syntax and GS1 Digital Link URI syntax are completely interchangeable

https://id.gs1.org/01/09506000134352/10/PX8L/21/1BAAAA2BB3?17=141100

When converting from a GS1 Digital Link to a set of GS1 element strings, there is no need to make an online lookup, all the information is provided in the GS1 Digital Link syntax.

6.3 Does everyone have to use id.gs1.org?

No. The GS1 Digital Link standard allows anyone to operate a resolver anywhere. The domain name does not matter, it is the structure of the rest of the GS1 Digital Link URI that carries the GS1 identifiers. It is assumed that product manufacturers and retailers will use their own domain names. It is a good idea to use short domain names as this will lead to shorter URLs.

6.4 Can I use GS1 Digital Link for applications other than consumer mobile devices?

Currently, the GS1 General Specifications only allows for open use of GS1 Digital Link URI syntax in QR Code or Data Matrix for consumer applications intended to be scanned by mobile device. This is a result of consumer devices being able to reliably interact with GS1 Digital Link URIs in those barcodes, while other scan environments are not yet ready.

The GS1 Digital Link Standard supports additional use cases beyond consumer engagement, such as at point-of-sale and other enhanced B2B processes. These environments may not yet be able to leverage GS1 Digital Link, but as capabilities progress, will be added into the GS1 General Specifications for open use.

Companies can use GS1 Digital Link for these more advanced use cases now or whenever they are ready. GS1 US is prepared to work with early adopters on the potential value to different use cases GS1 Digital Link can help with as well as working with solution partners who will help with implementations and technical details.

7 Glossary

The glossary lists the terms and definitions that are applied in this document. Please refer to the *www.gs1.org/glossary* for the online version.

Term	Definitions
GS1 Application Identifier (AI)	The field of two or more digits at the beginning of an element string that uniquely defines its format and meaning. (e.g., 01 for GTIN)
data carrier	A barcode, RFID tag, digital watermark etc. Any artefact that can be read either optically or via radio frequency interaction to extract an identifier.
GS1 Digital Link (DL)	A GS1 Standard, including a syntax that defines how to encode GS1 Application Identifiers into a barcode in a URL format
GS1 Digital Link URI	A Web URI/URL syntax for expressing GS1 identifier keys and attributes in a format using GS1 Application Identifiers and GS1 Application Identifier data fields as specified in the GS1 Digital Link standard
GS1 element string	A syntax for expressing GS1 identifier keys and attributes in a format using GS1 Application Identifiers and GS1 Application Identifier data fields.
link type	A machine-readable label for a link. For example, a product information page would have the link type 'pip' (there's significant extra information about this in the GS1 Digital Link standard).
resolver	A web server that processes GS1 Digital Link URIs in accordance with the standard and normal HTTP operations.

