GS1 Digital Link Syntax

Best practices for creating your QR Code powered by GS1

If you have a QR Code on your product, it's almost certainly because you want to interact with your customers. Traditional QR Codes contain a URL that points to an online experience of some kind, such as more information about the product, promotions, usage ideas and more.

We'd like to show you how you can upgrade a traditional QR Code to also scan at checkout by adding the same GS1 Global Trade Item Number® (GTIN®) that is in your product's EAN/UPC. You can also add things like expiration dates, batch/lot numbers and serial numbers, all of which can be retrieved without an online lookup.

> " **When we embedded GS1 Digital Link Syntax in our QR Codes, something magical happened. We connected everything to everyone at any time."**
>
> — Marcelo Silva
> **FOUNDER AND OWNER, PARLA DELI**

A GS1 Digital Link URI is a special kind of URL that performs two functions:

1. **Identifies a product**
2. **Provides an entry point to digital information about the product**

It's very carefully structured to allow your product's identification number to be read directly by a barcode scanner while also linking to online information from a mobile phone's camera or a more specialised app.

There is a lot of flexibility built into the standard to allow you to create your GS1 Digital Link URI in the way that makes the most sense for your business. And the following sections are designed to help you make those choices.

Use the brand's internet domain

Let's start with a simple example that just carries a Global Trade Item Number (GTIN):

https://example.com/01/09506000134352

Internet domain name   **GS1 identifier**

Best practice

If you can use any domain name, what is better than your own? It is recommended that you build your GS1 Digital Link URIs on a domain name you own and control. For a branded product, use the brand's domain name.
For example: https://dalgiardino.com/01/09506000134352

Benefits

1. Consumers will be confident that the URL their mobile phone will take them to is part of the brand, and they will be more likely to follow the link.

2. The internet domain name is a brand asset that can be transferred if the brand is sold or acquired. 2D barcodes containing a GS1 Digital Link URI on the brand's internet domain name will not need to be reprinted following the change of ownership of the brand.

Use a subdomain

Using a subdomain, the generic example becomes

https://sub.example.com/01/09506000134352

Domain name   **GS1 identifier**

Subdomain

Best practice

A subdomain can be anything, but we recommend using simply "id" to give a hint that this is an identifier for your item. To continue our Dal Giardino example, the GS1 Digital Link URI becomes:
https://id.dalgiardino.com/01/09506000134352

Benefits

1. The key benefit is that you can manage product identity separately from the rest of your website, perhaps by different people or teams. The processes managing a brand's website, for example, will be very different from the processes behind GTIN management. The use of a subdomain helps to keep them separate.

2. If you want to analyse how often, where and when your GS1 Digital Link 2D barcodes are scanned, using a subdomain keeps the statistics separate from those measuring visits to your website.

Use redirection

When you need to connect your product's identifier—the GS1 Digital Link URI—to its electronic information about the product, the best way is by *redirection*.

Best practice

If someone scans a QR Code powered by GS1 on your product, they will expect to be taken to information about that specific product. The redirection mustn't lead to somewhere requiring the user to click more links or search for the information they're after. This can create a poor consumer experience, and the user may leave the site without getting any information they find valuable.

The simplest thing to do is to redirect to the relevant page about your product on your website. It's also possible to redirect to a solution provider or any other service. Remember, if it's on the web, you can redirect to it.
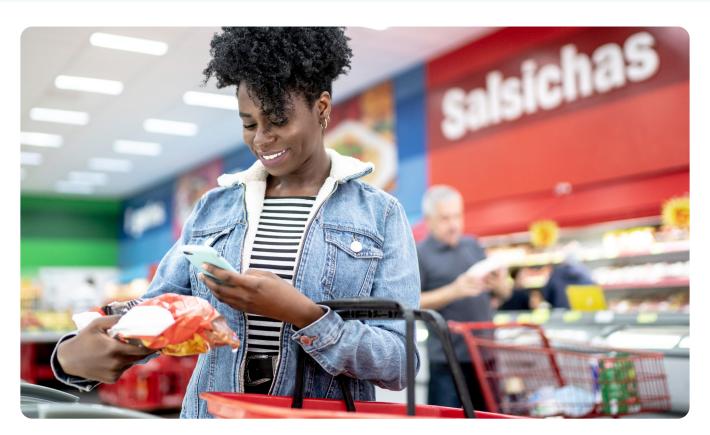
Talk to your local GS1 Member Organisation about how GS1 Digital Link allows you to link to multiple sources of information at the same time.

Tech detail

You see redirection all the time. For example, if you click this link https://kwz.me/hfi[1], you will be redirected to https://dalgiardino.com/risotto-rice-with-mushrooms/. This second URL is where you'll find information about this fictitious product. Redirection is a fundamental aspect of the World Wide Web and can be set up by any website administrator. Redirection is usually visible to the end user so that the address they see in their browser changes. Still, it's possible to redirect internally in a way that avoids this if desired.

Benefits

1. You can update where your GS1 Digital Link URI redirects to at any time without having to change your packaging. For example, you might link to a promotion for a limited period before switching the redirect back to the usual product information page.

2. Making use of redirection means that you can retain the distinction between the GS1 Digital Link URI as the identifier for your product and the electronic information about it.

[1] The kwz.me service is run by a private individual and is used purely as an example. It is not suitable for use in production-grade systems.

> **2D barcodes have immense potential, and we're excited to see how they will improve traceability and stock management."**
>
> — Richard Plunkett
> **GENERAL MANAGER, BUSINESS ENABLEMENT, WOOLWORTHS**

Best practice 4

Keep it short

You can add extra details to your GS1 Digital Link URIs but the shorter the GS1 Digital Link URI, the smaller the 2D barcode.

One way to minimise the size of the 2D barcode is to use upper case letters for the scheme and domain name. Upper case letters are more efficiently encoded than lower case ones in barcodes while, on the internet, the scheme (https) and domain name are case-insensitive. This means that HTTPS://EXAMPLE.COM and https://example.com are effectively the same. Using the more efficient form may reduce the size of your 2D barcode. Note that this is not true for the remainder of the URI. For example, a serial number of ABCDE is not the same as abcde.

Best practice

Include information that supports business processes, such as expiry dates and batch numbers (see next section), but do not add any information to the GS1 Digital Link URI that is not necessary.
This example: https://id.dalgiardino.com/01/09506000134352
does not include any extraneous information. The shorter the GS1 Digital Link URI, the smaller the 2D barcode.

If you have a particularly long brand name, then you may need to consider establishing a separate internet domain entirely that is a recognisable abbreviation of the brand. For example, "dgno" might be a suitable shorter version of Dal Giardino, but only do this if necessary, bearing in mind that using your full brand name will give consumers the most confidence to scan.

Benefits

1. Including more information in the GS1 Digital Link URI than is necessary is likely to be driven by marketing efforts in operation at the time. This makes it much more likely that you'll want to change it in the future, as marketing campaigns are constantly evolving. If this happens, you'll need to change the 2D code on all your items. Keeping the data encoded to a minimum makes it much more likely that the code can remain unchanged indefinitely.

Best practice 5

Include data to support business processes

The previous best practice warns against adding extra information to your GS1 Digital Link URI that is not related to product identity. That doesn't mean it's bad practice to add additional information such as batch/lot numbers, serial numbers, expiry dates, etc., that can be very useful in supply chain and retail processes. It is the ability to add exactly this kind of information that is the primary motivation for GS1's global migration to 2D barcodes.

Best practice

Use a tool to create a demo GS1 Digital Link URI barcode. GS1 provides a simple tool at https://gs1.github.io/2d-barcode-generator/, but many barcode generator software packages can do this too. You can always test whether your GS1 Digital Link URI is valid at https://www.gs1.org/standards/gs1-barcodes/gs1-barcode-syntax-resource.

Benefits

1. As already mentioned, a GS1 Digital Link URI is not "any old URL." It contains GS1 identifiers in a particular structure so that they can be extracted and used, for example, at the point of sale, without needing to make an online lookup. Using tooling dramatically reduces the opportunities for errors.

2. Nevertheless, a GS1 Digital Link URI is a URL so that a consumer can use their smartphone's camera without a specialist app and be taken (via redirection) to whatever information you want to provide. But that structure can also be recognised by specialist apps using the GS1 identifiers to provide their own information.

Questions about the future of QR Codes powered by GS1?

For authoritative detail of QR Codes powered by GS1, see the GS1 Digital Link URI syntax standard. For more general discussion and help, see the GS1 Digital Link quick start guide or contact your local GS1 Member Organisation to see how GS1 can help you begin your journey towards a new dimension in barcodes!