Accessing online product information with the GS1 Digital Link Standard

**Purpose of document**
This document illustrates how the existing GS1 barcode used for identification and traceability (e.g., GS1 DataMatrix, EAN/UPC and GS1-128) already on the product or pack and the GS1 Digital Link standard can be used to access online information about healthcare products. This document aims at providing objective educative information and does not intent to define any recommendation for implementation at this stage.

**Audience**
The main audience for this paper is the manufacturers and distributors of medical products, ministries of health, regulators, industry associations, solution providers and healthcare providers.

**What is meant by online healthcare product information**
Online healthcare product information refers to content such as electronic Product Information Leaflet (ePIL), electronic Instruction for Use (eIFU), instructional and informational videos, storage and handling information, interactions and any other content that can be accessed over the web.

**Executive summary:**
GS1 Healthcare’s aspirational goal is for a single GS1 barcode to be used for both identification and traceability purposes, as well as to access digital content. Benefits from this approach include label simplification and reduction of confusion risk. However, GS1 Healthcare acknowledges that this may not be possible in some cases and so an additional 2D barcode may be needed to allow access to digital content.

To avoid unnecessary changes to packaging and the risk of confusion, it is recommended that regulations and tender requirements should allow the use of the already applied GS1 barcode for both identification of the product and for access to online content.

GS1 has submitted a call for action to mobile phone operating system providers to enable native scanning of the GS1 DataMatrix by mobile phones.

GS1 Healthcare does NOT recommend the use of QR codes for product identification and traceability.

**Standards based solutions**
The GS1 barcode already found on millions of healthcare products all over the world, the GS1 Digital Link URI Syntax standard, a mobile device app and a GS1 standards conformant resolver provide the foundation to develop secure solutions to access product information online.

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The GS1 Digital Link URI Syntax standard delivers straightforward specifications and rules that solution providers can use when developing solutions that translate the existing data from GS1 barcodes (e.g., GS1 DataMatrix, EAN/UPC and GS1-128) into connections that enable an endless number of use cases. For more information about the GS1 Digital Link URI Syntax standard refer to the link at the end of this document.

Below is a non-exhaustive list of possibilities.

- Use of the variable data such as batch/lot and/or a serial number to enable a product verification solution within a regulatory framework.
- Solutions that help identify counterfeit products as part of an initiative to fight falsification of medicines and medical devices.
- Instructional videos aimed at healthcare professionals and patients.
- Product information and other trusted digital content that provides important information to patients and healthcare providers.

There are several elements that make up a GS1 standards-based Digital Link ecosystem, for example:

**A barcode**

GS1 Healthcare’s recommendation is that the GS1 barcode used for identification and traceability purposes is also leveraged via an app to access online information.

However, GS1 Healthcare acknowledges that this may be challenging and perhaps not possible in some cases. Additionally, labelling changes are required in cases where an additional 2D barcode (i.e., QR Code) is added to the pack to access online information. More information about GS1 DataMatrix and QR codes can be found in the paper titled *The key role of GS1 DataMatrix barcodes for product identification in healthcare* on the GS1 Healthcare website.

To avoid unnecessary changes to packaging and risk of confusion, regulations and tender requirements should not mandate the use of a specific type of 2D barcode and should allow the use of the most appropriate one.

**A Mobile Device app and the GS1 Digital Link URI Syntax**

The GS1 barcode used for identification purposes encodes only GS1 Application Identifiers (AIs). However, it’s easy to convert the GTIN, and other data in the barcode, into a Web address following the [GS1 Digital Link URI syntax](https://www.gs1.org/digitallink). The conversion must be performed by a mobile device application that introduces an internet domain name which is not included in the GS1 DataMatrix. This means that apps carrying out this conversion will likely point to a single reference location online as the start of the journey towards the desired content. For additional supporting information refer to the GS1 Barcode Syntax Resource. This is a free open-source reference software that makes the conversion easier.
In response to the app the internet domain owner can respond in a variety of ways. Such as information about the product, a digital leaflet, videos or simply be redirected to another authoritative source of information such as a national eLeaflet repository.

**A resolver**

A GS1-Conformant Resolver is very useful when it is necessary to point to multiple sources of information. See the example in option 1 below for more information about resolvers.

Solution providers can develop an endless number of applications that can help patients and care providers become more informed by connecting them to all types of information about products – all made possible by using the internet and trusted GS1 standards.

For more information see the published document *GS1 Digital Link: A single barcode for identification, authentication and access to information for medical products* on the GS1 Healthcare website.

**How to use the GS1 Digital Link standard in healthcare**

There are two basic ways the GS1 Digital Link standard can be used to create solutions to access online product information with the existing GS1 barcode.

This document provides an overview of options for using GS1 standards in healthcare. It is not intended to provide design specifications for a particular technical solution.

**Option 1:**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>How to access the online information</th>
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</table>
| There are multiple sources of information in multiple destinations available online. For example, leaflets in various languages, videos, audio files, clinical information, instructions for use and more. | 1. The app takes the information from the GS1 barcode, and using the GS1 Digital Link URI Syntax standard, connects to a GS1-Conformant Resolver that contains various web addresses (i.e., URLs) - one for each piece of online information.  
2. The resolver responds to the request from the app and provides the available web link(s) for the specific product information.  
3. The user chooses the desired information. |

In this scenario the mobile device application scans the GS1 barcode containing a GTIN, and other data elements as available (e.g., Batch/Lot, Expiry Date and Serial Number) which are transferred to the resolver technology.

A resolver is a repository that connects GTINs with web links that lead to information about a specific product. The resolver responds to the request from the mobile application and provides web links registered for that product.
The links can serve a variety of purposes and there is no limit to the number of links that can be associated with a single GTIN.

The mobile device app scans the GS1 barcode and connects to a resolver

The combination of mobile device applications and a resolver provide a foundation to solution providers to developed secure and specialised solutions and services that help improve supply chain operations, patient safety and medical outcomes.

Option 2:

<table>
<thead>
<tr>
<th>Scenario</th>
<th>How to access the online information</th>
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<tbody>
<tr>
<td>There is one piece of online product information in a single location.</td>
<td>An app takes the information from the barcode and based on the GS1 Digital Link URI Syntax standard, turns it into a web address and the online product information is displayed on the mobile phone.</td>
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</table>

In this scenario the mobile device application scans the GS1 barcode containing a GTIN and other data elements as available (e.g., Batch/Lot, Expiry Date and Serial Number) and constructs a web link following the GS1 Digital Link URI Syntax standard. This will provide access via the device’s web browser to the online information. This is a good option for scenarios where there is a single destination for the information. For example, a web link to the location of a leaflet on a national repository, or the manufacturer’s website. See illustration below.

For more information refer to [GS1 Digital Link Standard: URI Syntax](#).

For more information refer to section 7.1 Resolver Functionality of the [GS1 Digital Link Standard](#). Note: At the time of writing, an updated resolver standard is close to completion. Information will be made available via the GS1 website.
If a QR Code is needed, in addition to the GS1 barcode applied for identification and traceability purposes, it should be strictly limited to accessing digital content. In this case it should leverage the GS1 Digital Link URI Syntax standard and should contain the same identifier as the GS1 barcode.

For more information refer to the GS1 General Specifications, section on the GS1 Digital Link URI syntax standard for extended packaging applications for trade items.

GS1 has submitted a call for action to mobile phone operating system providers to improve native scanning.

**Frequently Asked Questions**

1. **Can I use the existing GS1 barcode on the product for both regulatory compliance and to access eLeaflets?**

   Yes, the existing GS1 barcode can be used to comply with regulatory requirements and to access product information online. One of the benefits is that the existing barcode can be used with NO changes to the packaging artwork.

   For more information see the section above titled How to use the GS1 Digital Link URI Syntax standard in healthcare.

2. **Can the GS1 Digital Link URI Syntax standard work without a QR Code?**

   Yes, the GS1 Digital Link URI Syntax standard was designed to work with all GS1 barcodes without having to add an additional QR Code to the pack encoding a URL.

   This is the preferred way of using the GS1 Digital Link URI Syntax standard in healthcare applications. It supports the GS1 Healthcare ambition of reducing, and ultimately eliminating, multiple barcodes.

3. **What is GS1’s guidance if national requirements such as regulation require the use of a QR Code to access online product information?**

   GS1 strongly recommends that national requirements align with the principle of single barcode and the use of the GS1 Digital Link URI Syntax standard in the national requirements. Refer to options 1 and 2 as described above for more information.

   If a QR code is required to access online product information, GS1 recommends that the URL encoded in the QR Code is based on the GTIN, and other data elements as needed, encoded in the GS1 barcode. For more information refer to the GS1 Digital Link Standard: URI Syntax.
4. Do I need a phone app to access eLeaflets when using the existing GS1 barcode?
Yes, a mobile device application is required to scan GS1 barcode and access eLeaflets and other information online.
For more information see the section above titled How to use the GS1 Digital Link URI Syntax standard in healthcare.
GS1 has submitted a call for action to mobile phone operating system providers to improve native scanning.

5. What is GS1 Digital Link URI Syntax?
GS1 Digital Link URI Syntax is simply a way to encode GS1 identifiers, such as the GTIN, batch/lot, serial number and expiry date in the form of a URL. This creates a dual-function string of characters that is both a product identifier and a link to online information. For more information refer to GS1 Digital Link Standard: URI Syntax.

6. What is a GS1 standards conformant resolver?
A GS1 conformant resolver connects a GS1-identified item to one or more online resources that are directly related to it. For more information refer to section 7, Resolving GS1 Digital Link URIs, of the current GS1 Digital Link Standard but please note that, at the time of writing, an updated standard for GS1-conformant resolvers is close to completion. Information will be made available via the GS1 website.

7. Where do I get more information about the GS1 Digital Link URI Syntax standard?
Refer to the GS1 Digital Link website for complete information.

Reference Documents
- The latest version of the GS1, “GS1 General Specifications“ is always available at https://ref.gs1.org/standards/genspecs/
- The GS1 Digital Link Standard https://ref.gs1.org/standards/digital-link/
- GS1 Digital Link URI Syntax https://ref.gs1.org/standards/digital-link/uri-syntax/