HTTP Uniform Resource Identifiers to associate a web resource with a GS1 key and optional Application Identifiers

Technical proposal as input to GTIN+ on the Web MSWG at GS1

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1. Background

Requirements for presenting GS1 data captured from different carriers in a web-friendly format have emerged recently from different areas:

1. The Next Generation Product Identification (NGPI) project is considering making use of an HTTP URI prefix, a GS1 Key and standard attributes to enable consumers and other parties to access trusted detailed product information.
2. The Open Mobile Alliance (OMA) is the leading industry forum for developing interoperable mobile service enablers. GS1 is working with OMA to develop a universal bar code scanning specification including a standard Application Program Interface to access trusted data within the GS1 Source network.
3. The GS1 Digital program has two major components: 'GTIN on the web' and GS1 Source. The 'GTIN on the web' project aims to promote the use of structured data including standard product identifiers and attributes in web applications.

2. Scope

The scope of this paper is to propose a standard way for web applications to reference data associated with GS1 Keys, taking into account the established GS1 identification and capture standards. It suggests an additional application layer on top of the existing GS1 standards for encoding and decoding data to and from GS1 standard data carriers.

3. Proposal

The proposal is to create a new GS1 Application Identifier (AI) that will achieve the following when processed by the software application:

1. Verify that the data captured include a URI prefix, a GS1 key and possible relevant attributes related to this key; generate error messages if the data captured lacks these components.
2. Lookup the AIs in a table and translate them into short names.
3. Generate a web-developer-friendly HTTP URI string organised in a logical sequence, i.e. HTTP URI prefix + GS1 Key + attribute(s).

For example:

An HTTP URI prefix, a GTIN and serial number are encoded in GS1 QR Code symbol. The data string coming out of the decoding process looks like this:

]Q3 XX http://example.com 01 01234567890128 21 ABC321

(Note: spaces are included for ease of reading)

]Q3 = symbology identifier for GS1 QR code
XX = AI (to be allocated) indicating the encoding of a URI prefix
http://example.com = the actual URI prefix
01 = AI for GTIN
01234567890128 = GTIN
21 = AI for serial number
ABC321 = serial number

The new AI would then trigger another software process transforming the decoded data string into the following string:
http://example.com/gtin/01234567890128/ser/ABC321

This string is easy to read and can be used by web application developers to access data using the GTIN and optionally the batch or serial number and to deliver added value services.

4. Discussion

1. What are the benefits?

Compatibility. This approach does not require any changes to AIs and data carrier specifications that GS1 currently has. It works with all GS1 data carriers that support AIs or equivalents. It should be noted that these HTTP URIs are not to be used in place of GS1 element strings or Electronic Product Code URNs in standards such as EPCIS or ALE. Instead, these HTTP URIs belong in the 'Share' layer of the GS1 System Architecture and are used for both retrieving structured data about products and for use in Linked Data technology to represent the GTIN as the subject or object of multiple factual statements.
Extensibility. The requirements today focus on GTIN and access to product information. The proposed approach can work with any GS1 key and related attributes.
Data ownership and control. Although these HTTP URIs may look like web addresses (URLs), there is no recommendation that all data about a product (or even traceability or transaction information about individual product instances) should be published openly on the web. At all times, brand owners and retailers will retain full control over which product-related data they choose to publish openly.

2. Why not using the existing AI 8200 already available for encoding a URL prefix?

AI 8200 has not been widely implemented, if implemented at all. It is restricted to GTIN and it does not trigger the web-developer-friendly format. A new AI is thus required. A deprecation of AI 8200 could be considered following an assessment on current usage.

3. What standard developments would be required for this solution?

The proposal presented in this paper would require the following standard developments:

- A set of standard short strings to be used to introduce a URI component for each relevant AI, e.g. "ser" in a URI refers to AI 21.
- A new AI for encoding the URI prefix with precise rules addressing
    - validation
    - the mapping of AIs to URI components
    - the format of the web-developer-friendly URI string
- An updated B2C Extended Packaging Application Standard
- Update to AIDC Validation Rules
- OMA input of the current B2C standard and the Working Draft per this proposal

5. Next steps

This technical proposal document is intended as input to the new GS1 GTIN+ on the Web MSWG, where these URI structures will undergo formal technical standardisation. The GS1 GTIN+ on the Web MSWG will work closely with the Next Generation Product Identifier (NGPI) MSWG and also ensure close communication with the Open Mobile Alliance (OMA) to avoid divergence or duplication of effort.