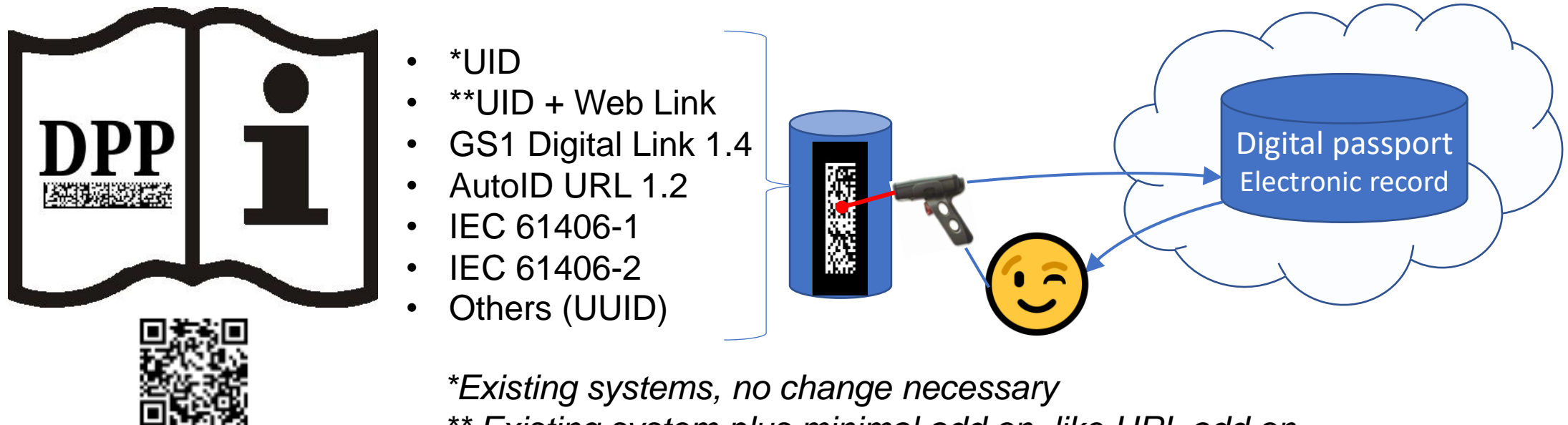# DPP IDENTIFIER
Comparison of methods

Research and considerations in response to the
Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for setting ecodesign requirements for sustainable products, Brussels, 30.3.2022 COM(2022) 142 final, 2022/0095 (COD)

- *UID
- **UID + Web Link
- GS1 Digital Link 1.4
- AutoID URL 1.2
- IEC 61406-1
- IEC 61406-2
- Others (UUID)

*Existing systems, no change necessary
** Existing system plus minimal add on, like URL add on

Others are new and would require change or second system

Digital passport
Electronic record

EDCi 231214/240130

The product passport framework includes:

Unique item identification conforming to „ISO/IEC 15459 Unique Identification"
and
WEB link for access to the product passport and item related information.
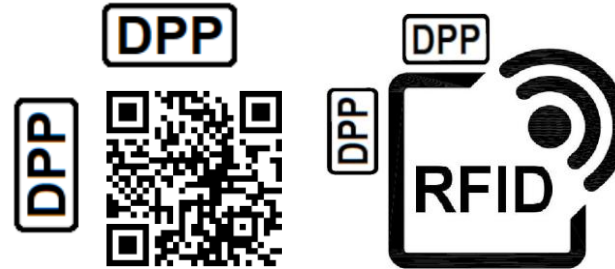
This research will compare given methods for item identification with WEB link features but also new WEB solutions and developments:

Method I) Unique ID and Unique ID applied with WEB link method
"UID first" with ASC Data Identifiers and syntax and ISO/IEC 15459 features but transmission to the WEB according to RFC syntax "URL first" (given backward compatible method)

Method II) GS1 Digital Link proposal „URL first" using GS1 Application Identifiers for embedded ISO/IEC 15459 features and attributes

Method III) AutoID URL proposal „URL first" using ASC Data Identifiers for embedded ISO/IEC 15459 features and attributes

Method IV) IEC 61406-1, -2 Identification Link "URL first", domain name as ID, ISO/IEC 15459 UID as option for IEC 61406-2

Method V) Other methods
Universally Unique Identifier (UUID), …

COMPARISON of identifiers suitable for DPP

Method	Principle	15459	Options/features	Estab-lished	Example	For DPP
I: UID + syntax	ID first + attributes, offline + online with portal or option URL	YES	UID with AIs+syntax UID with DIs+syntax UDI with System ID UDI for MDs	YES → (+ URL add on)	FOR EXISTING SYSTEMS & LOGISTICS (01) 01234567890128 (8200) https://example.com .25SQCABCD1234567^34Lhttps://www.portal-99/?SCAN= +HIBCUDIPRO12/$L87654/S12345M .9N1312345UDIPRO121XX^S12345^34Lhttps://www.portal-99/?SCAN=	ID first+URL ID first+URL ID first UDI portal ID first+URL
II: GS1 digital link	URL first + attributes, offline + online	YES	URL + AIs, RFC syntax	2023 (1.4)	FOR NEW SYSTEMS/INVETSMENTS https://id.gs1.org/01/09520123456788/21/12345 *(source Digital Link standard 1.3.0, chapter 5.4)*	URL first
III: AutoID URL	URL first + attributes, offline + online	YES	URL + DIs, RFC syntax	2023 (1.2)	FOR NEW SYSTEMS/INVETSMENTS https://srv.de/ART?.25P=QCELMIPRODX12&.14D=20241231&.1T=PXBL&.S=YYYY2BB3	URL first
IV.a: IEC 61406-1	URL, online	NO	URL only	2022	FOR WEB SYSTEMS ONLY https://www.domain-abc.com/free_text	URL only (limited)
IV.b: IEC 61406-2	URL + attributes, offline + online	Option	URL + AIs, RFC syntax	2024	FOR NEW SYSTEMS/INVETSMENTS https://www.domain-abc.com/sd09fqw4?.18V=UN123456789&.1P1A2B3C&.S=54321	URL first
V: Others	UUID, Decentralised identifiers	NO	?	?	To be designed. Potential options: Application of an ID (DI) „who is responsible, what is it about?", like DI „5R" or a combination of a unique product ID with DI „25P" and „S" to identify the UUID as a Serial number.	?

I) DPP METHOD: Unique ID applied with WEB link using ASC Data Identifiers:
"ISO/IEC 15459 **UID first**" for transmission to the WEB
 according to RFC syntax "URL first" (backward compatible method)

ISO/IEC 15459-4 option "unique serial number"
applied with URL option by ISO/IEC 15418 ASC MH10 DI „34L- Pointer to Process URL"
additionally documented by „DIN SPEC 16589 Automatic identification and data capture techniques -
Traceability Pointer to Process" and other references.

<DI><Issuing Agency Code (IAC)><registered Company Identification Code (CIN)><value><...>

e.g. Unique Serial Number <1234567> applied with DI <.25S>, IAC <QC> and CIN <ABCD>:
.25SQCABCD1234567,
followed by the URL for access to the information dedicated to the unique serial number,
 e.g. .25SQCABCD1234567^34Lwww.portal-99/?SCAN=

Advantages: ISO/IEC 15459 party ID, data and Internet link in one, compatibility with existing applications in industries and healthcare

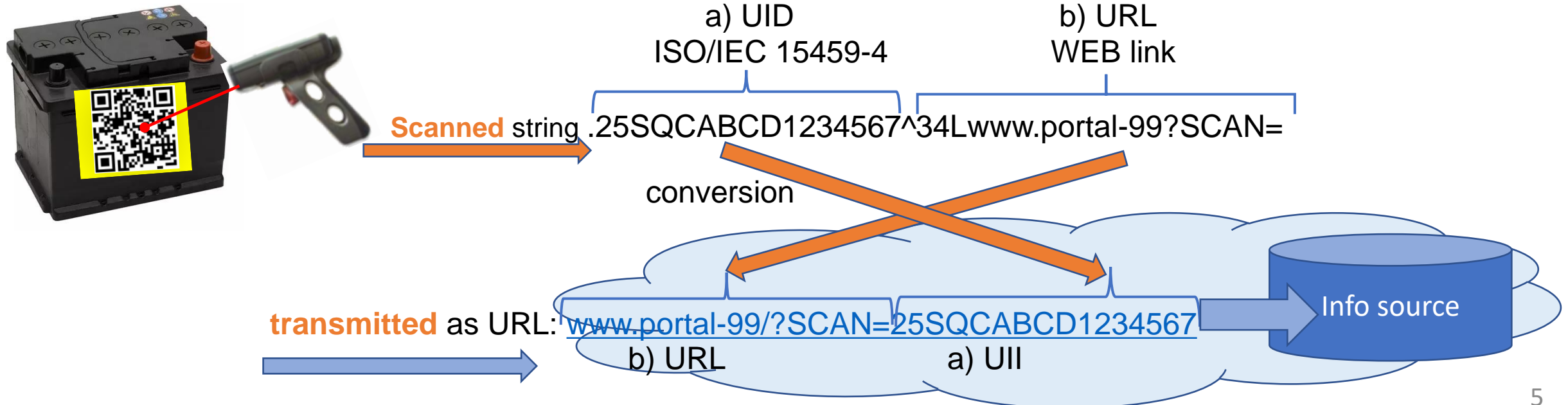*Conversion "UID first" to "URL first" for WEB access is illustrated under I.I) at following page (4).*   4

I.I) Illustration DPP method "ISO/IEC 15459 UID first" combined with WEB link "**URL first**" using ASC DIs

FOR COMBINED UID+URL application ISO/IEC 15418-ANSI MH10.8.2" is defining ASC DI "34L" as follows:
Pointer to Process URL (P2P URL) for initiating a URL to carry all other data elements encoded in an AIDC media according to the following rule: Scan the code and initiate the URL starting with the P2P URL string, omitting DI 34L, envelope syntax] (prefix and postfix) and append all other data elements that have been scanned in same sequence as encoded in the media, including DIs and data element separators.
FUNCTIONALITY:
The data string will be encoded "UID first" (25S) and identified as unique serial number applied with an URL.
For access to the WEB source of information the rules of ASC DI "34L" apply: Convert "UID first" to "URL first":

a) UID
ISO/IEC 15459-4

b) URL
WEB link

Scanned string .25SQCABCD1234567^34Lwww.portal-99?SCAN=

conversion

transmitted as URL: www.portal-99/?SCAN=25SQCABCD1234567

b) URL

a) UII

Info source

I.II) : Other EU projects with unique identification of items using ISO/IEC 15459

*UDI: **REGULATION (EU) 2017/745 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 April 2017**
 Feature: ISO/IEC 15459 conforming Unique identification of medical devices and IvD (UDI) with references to data base EUDAMED
 but without encoded WEB Link

TOBACCO: **COMMISSION DELEGATED REGULATION**
(EU) 2018/573 of 15 December 2017 on key elements of data storage contracts to be
concluded as part of a traceability system for tobacco products
Feature: ISO/IEC 15459 conforming Unique identification of tobacco products
with unique reference to primary and secondary repositories.

FISHBOXES: **EN 17088 Fishery and aquaculture products –**
 Requirements for labelling of distribution units and pallets in the trade of fishery and aquaculture products
Feature: ISO/IEC 15459 conforming Unique identification of fishboxes and fishery parameters like
catch, catch location, vessel, etc., but without encoded WEB link.

GS1 - *Proposed Architecture and Principles for Digital Product Passports

Source: Source: GS1 in Europe – March 2022, contact GS1: Francesca Poggiali (francesca.poggiali@gs1.org)
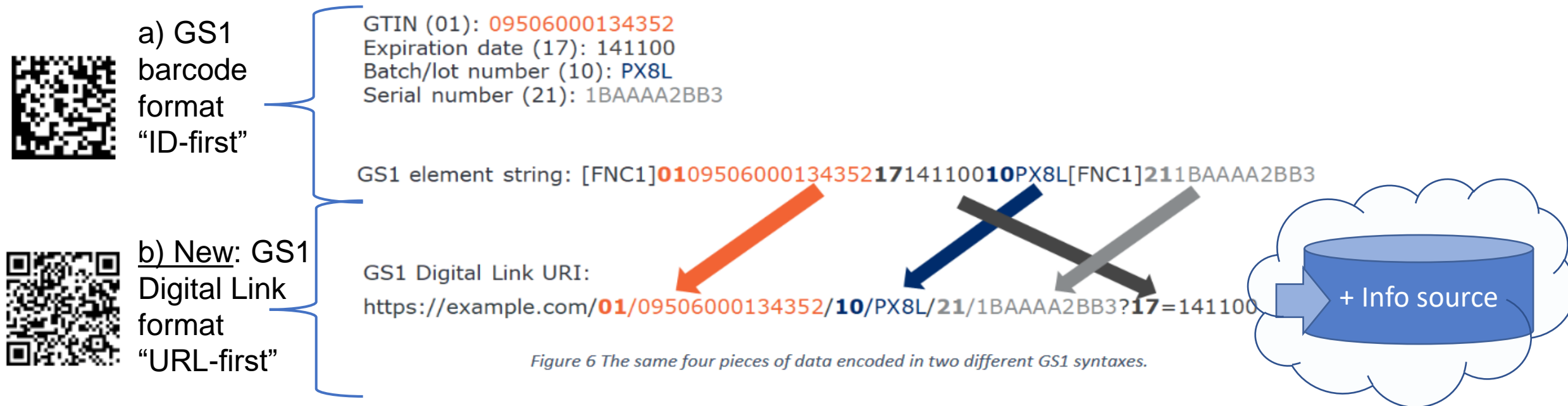
Page 8+9:
5. It is the content of the data carrier that triggers the relevant behavior on the device, not the type of data carrier.
6. Mobile phone apps can be programmed to work with any optical data carrier.
7. No smartphones currently recognize RFID tags without additional hardware.
Examples of two of GS1's syntaxes are given in the diagram below, which shows the same four pieces of data encoded in a single message but in two different ways

a) GS1 barcode format "ID-first"

GTIN (01): 09506000134352
Expiration date (17): 141100
Batch/lot number (10): PX8L
Serial number (21): 1BAAAA2BB3

GS1 element string: [FNC1]**01**0950600013435**217**141100**10**PX8L[FNC1]**21**1BAAAA2BB3

b) New: GS1 Digital Link format "URL-first"

GS1 Digital Link URI:
https://example.com/**01**/09506000134352/**10**/PX8L/**21**/1BAAAA2BB3?**17**=141100

+ Info source

Figure 6 The same four pieces of data encoded in two different GS1 syntaxes.

NOTE: Subject to reference to ISO/IEC JTC 1/SC 31/WG 2 project "Encoding and resolving identifiers over HTTP"
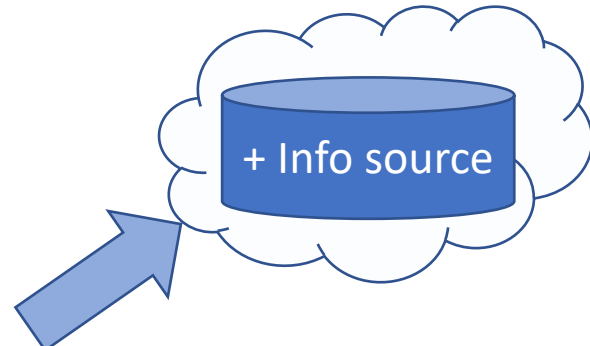
III) DPP METHOD: "AutoID URL" URL first, information embedded

IIIa) applied with ISO/IEC 15459 conforming data elements and attributes

Example product ref. „PRODX12 + ‚n' attributes, data elements applied with ASC data identifiers:

ASC UID (25P): QCELMI**PRODX12** ← *data element conforming to ISO/IEC 15459*
Expiration date (14D): 20241231
Batch/LOT number (1T): PXBL ← *attributes*
Serial number (S): YYYY2BB3

+ Info source

+Domain https://srv.de:

https://srv.de/ART?.**25P**=QCELMI**PRODX12**&.14D=20241231&.1T=**P**XBL&.**S**=YYYY2BB3

https://srv.de/ART?.25P=QCELMIPRODX12
&.14D=20241231&.1T=PXBL&.S=YYYY2BB3

URL Root
System Identifier for ASC DIs " ."

ASC DI "25P" prior to
*ISO/IEC 15459 sequence IAC+CIN+PRODUCT ref.*

& attributes (here Date&LOT&SN)

Note: Method developed by EDCi and EDIFICE, subject to referenced by ISO/IEC JTC 1/SC 31/WG 8 project "Encoding and resolving identifiers over HTTP"

For detailled EDIFICE/EDCi specification: „AutoID URL" see www.e-d-c.info

# III) DPP METHOD: "AutoID URL" URL first, online as offline,

IIb) applied with data elements used in *automotive industries for serialized product IDs,

Example data applied with ASC data identifiers ("ID first" format used in barcode and RFID):

*(37S)UN12345678999755512300FFFAS+123456

ASC DI	DUNs No.	Product ref.	SN
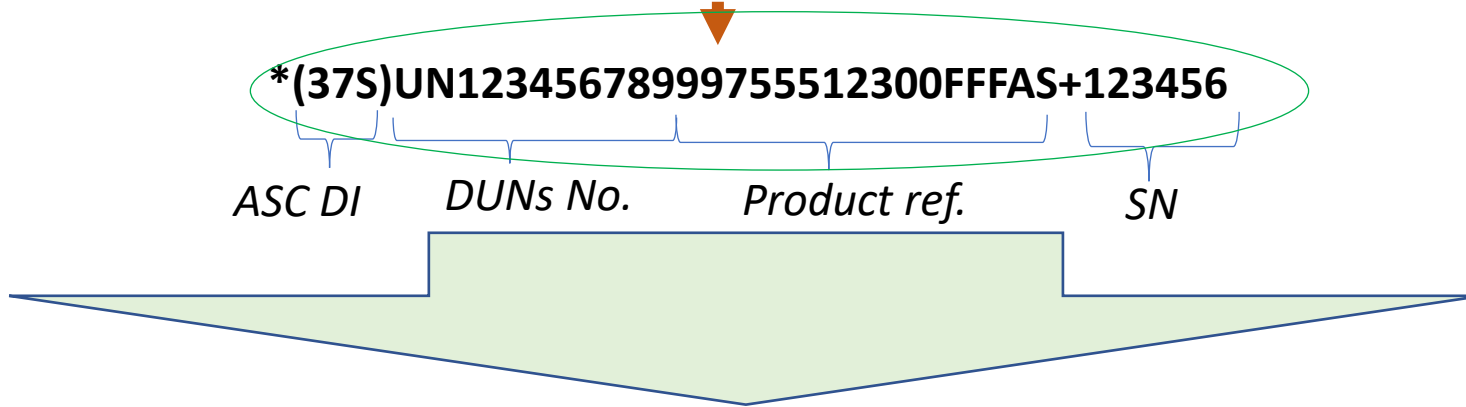
Plus URL, e.g. **https://www.domain-abc.com/sd09fqw4**
AutoID URL: *https://www.domain-abc.com/sd09fqw4?.37S=* **UN12345678999755512300FFFAS+123456**

https://www.domain-abc.com/sd09fqw4?.37S= **UN12345678999755512300FFFAS+123456**

Note: „+" in RFC coded as „%2B"

+ Info source
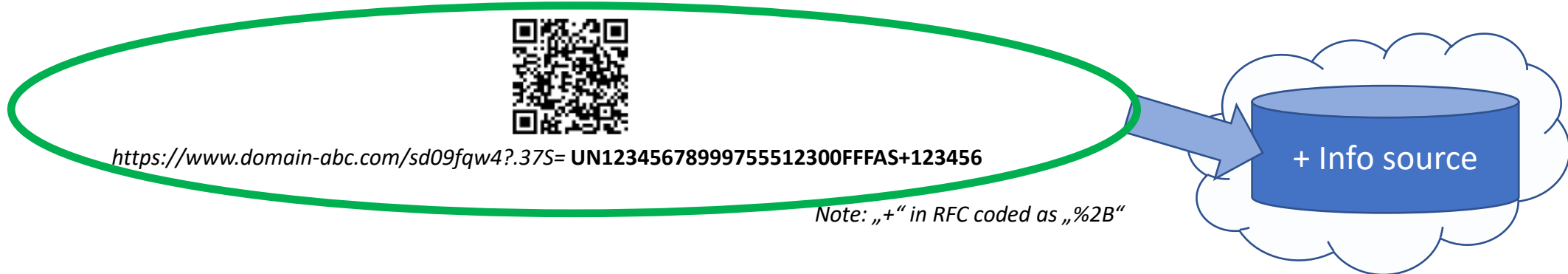
*IV) DPP METHOD: IEC 61406-1, -2 Identification Link (Domaine URL as party ID)

IEC 61406-1 is using the whole URL as unique ID string →   *https://www.domain-abc.com/free_text*
(attributes and its formats are not defined but up to the labeler)

***IEC 61406-2 has capacity for formatted product attributes
encoded by ISO/IEC 15418 ASC Data Identifiers, use of ISO/IEC 15459 UIDs is an option,**
e.g. ASC DIs with ISO/IEC 15459 sequences with ASC DIs "18V", "25S", 25P", etc.

**Example for a serialized item with combined DUNS-number, product code and serial number
https://www.domain-abc.com/sd09fqw4?.18V=UN123456789&.1P1A2B3C&.S=54321

URL first

System Identifier for ASC DIs " . "

ISO/IEC 15459 sequence IAC (DUNS)+CIN+Product ref.+SN

+ Info source

*https://www.domain-abc.com/sd09fqw4?
.18V=UN123456789&.1P1A2B3C&
.S=54321*
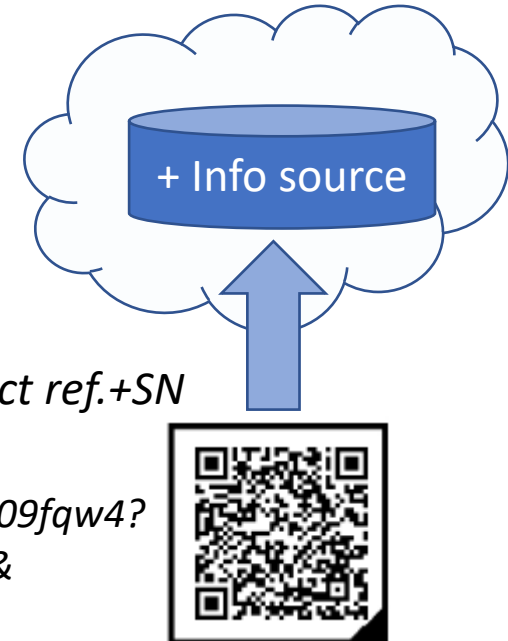
*Note: DPP METHOD III "AutoID URL" and IV "IEC 61406-2" can carry same data, but "IEC 61406-2" is defining the domain name as the ID for the responsible party.

**Source: IEC 61406-2, ED1: 2023-05-26, chapter B,1.7

V) Other methods.

There might be other methods suitable for DPP identifiers. Where the examples I) to IV) contain "centralized" identifiers of hierarchical schemes "decentralized" identifiers have been mentioned as potential method as well, but definitions, features and uniqueness for global environments need to be checked for fulfilling the DPP requirements.
One method for generating unique serial numbers could be the method "**Universal Unique Identifier (UUID)**",
but for global and unique identification it would be necessary to apply an information "who is responsible, what is it about," e.g. by help of ISO/IEC 15418 identifiers.

Scenario UUID: *WIKIPEDIA <https://de.wikipedia.org/wiki/Universally_Unique_Identifier> tells:*
*"An UUID consists of a 16-byte number, which is written in hexadecimal and divided into five groups. In its normal form, a **UUID** looks like this, for example: 550e8400-e29b-11d4-a716-446655440000"*

Within a JSON string such an UUID can be identified by data type "uuid" but how to get it unique for AutoID with Barcode/RFID?

Two options may illustrate possibilities to add global uniqueness to an UUID if used with AutoID:.

Option 1: Add to UUID the responsibility, e.g. by ASC DI "5R" in the sequence:
<System Identifier><DI><ISO/IEC 15459 Issuing Agency Code><Company ID><UUID value>.
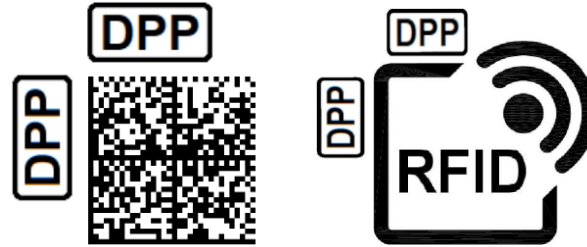*Example: <.><**5R**><QC><COID><:><**550e8400-e29b-11d4-a716-446655440000**>*

.5RQC<u>COID</u>:**550e8400-e29b-11d4-a716-446655440000**

Option2: Add meanings with "unique product ref." and define UUID as related serial number,
*e.g. by sequence <SI><DI "25P"><IAC"QC"><CIN"COID"><Prod ref"**X1Y2Z3**"><DI"S"><UUID>*

.**25P**QC<u>COID</u>**X1Y2Z3**^<u>S</u>550e8400-e29b-11d4-a716-446655440000

The editors team would welcome any input to other methods to complete the scenarios.

Please don't hesitate to supply additional input specifically to V) Other methods or ask any question related to AIDC standards development.

Your EDCi Team
contact: Heinrich Oehlmann

Eurodata Council Institute e.V.
ISO/IEC 15459 Support Agency
Kösener Str. 85, 06618 Naumburg, Germany
phone: +4934457811 60, fx: +4934457811 61
email: heinrich.oehlmann@e-d-c.info, web: www.e-d-c.info
Association Register Stendal, Germany Nr. VR6180