



The Global Language of Business

GS1 System Architecture

Fundamental Building Blocks of Identify, Capture, Share

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GS1 believes in the power of standards to transform the way we work and live

How we develop standards

The **GS1 Global Standards Management Process** ensures our standards are truly global:

1. Determine relevance



2. Gather requirements



3. Create standards



4. Develop collateral



Global partner organisations



- **115 local Member Organisations**
- Over **2 million companies** use GS1 standards
- Over **100 million products** carry GS1 barcodes
- Over **6 billion GS1 barcodes** are scanned every day

The power of standards



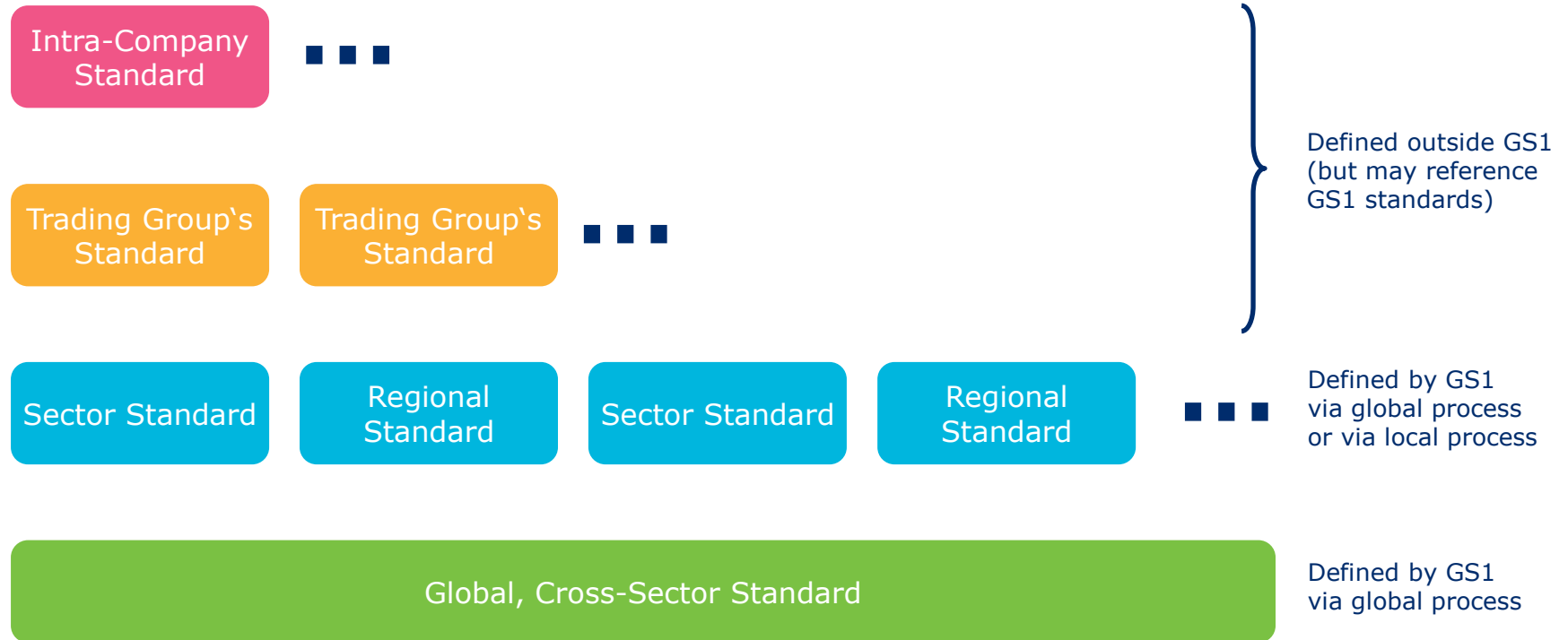
- Standards facilitate **interoperability**
Different parties rely on standards to share information without knowing each other
- Standards enable **competitive** solutions from different vendors
Users can chose from different solutions that rely on the same standards
- Standards encourage **innovation**
Standards provide a solid base for building scalable solutions



- The **GS1 System** is the collection of standards, guidelines, solutions, and services created by the GS1 community

- The **GS1 System Architecture** is a conceptual model of the GS1 System
 - *It shows how the standards fit together*
 - *It articulates underlying technical principles*
 - *It helps to guide the development of future standards*

The scope of standards





- **GS1 Standard:** Normative specifications and rules
- **GS1 Guideline:** Useful information to implementing GS1 Standards
- **GS1 Service:** GS1 Standards-based total and/or capability offered to industry to address a specific business need
- **GS1 Solution:** GS1 offering to industry that combines GS1 Standards, Services, Guidelines, and/or other activities to address a specific business need

The GS1 System Architecture in just 3 words **AIPI**



IDENTIFY



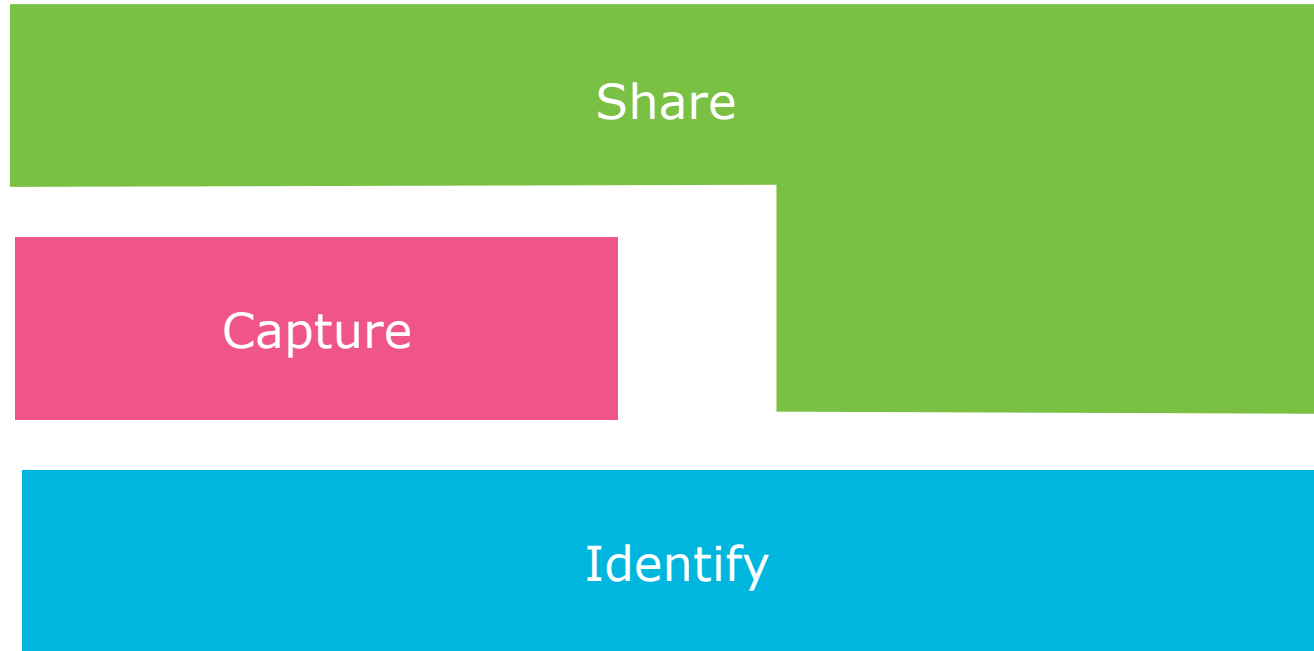
CAPTURE



SHARE

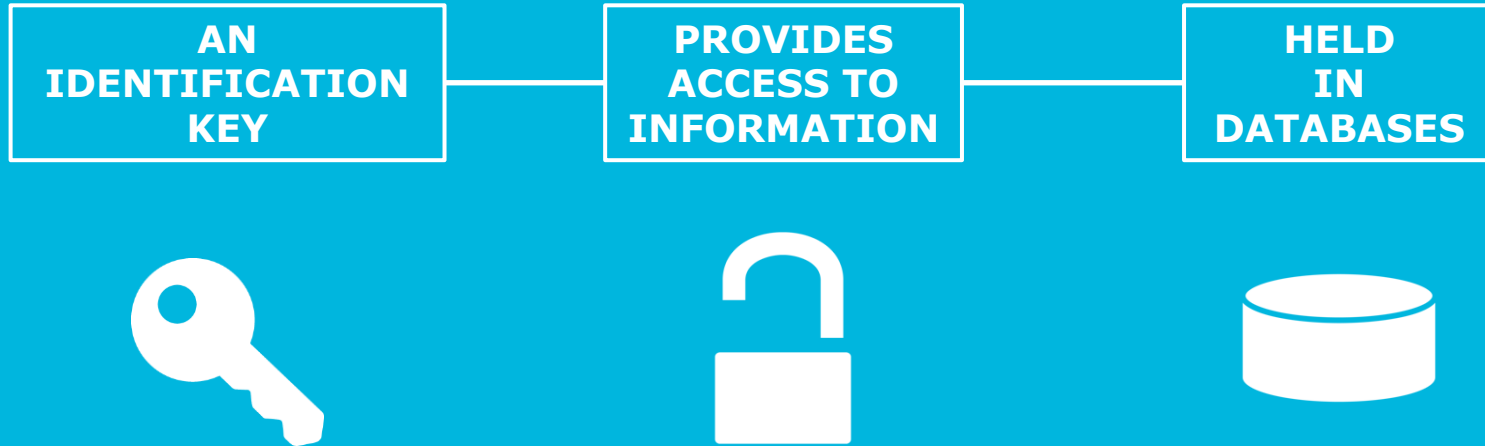
GS1 Standards for **identify**, **capture**, and **share** information make it possible for companies to speak the same language, connect with each other, and move their business forward

... or in one picture





What are identification keys?



- **Attribute:** A piece of information associated with an entity. Something can be recognised as an attribute if one can construct a sentence of the following form: “The [attribute name] of [entity] is [attribute value].”

e.g.: The colour of this wine is red

- **Key:** An attribute or group of attributes of an entity that serves to uniquely identify that entity.

e.g.: The Global Trade Item Number (GTIN) is a key identifying a class of products

Classes of GS1 identification keys



- **Class 1:** Keys administered by GS1 and fully under its control
e.g.: Global Trade Item Number (GTIN)
- **Class 2:** A portion of the capacity is allocated to an external agency
e.g.: International Standard Book Number (ISBN)
- **Class 3:** External keys which are supported in some parts of the GS1 system
e.g.: Bureau International des Containers (BIC)
- **Other Keys**

Identify: different syntaxes, same meaning



AIPI

Example of a Global Returnable Asset Identifier (GRAI) with:

- GS1 Company Prefix: 0614141
- Asset Type: 23456
- Check Digit: 1
- Serial Component: 789

Syntax	Example
Plain	0614141234561789
GS1 element string	(8003) 00614141234561789
EPC URI	urn:epc:id:grai:0614141.23456.789
GS1 Digital Link URI	https://id.gs1.org/8003/00614141234561789

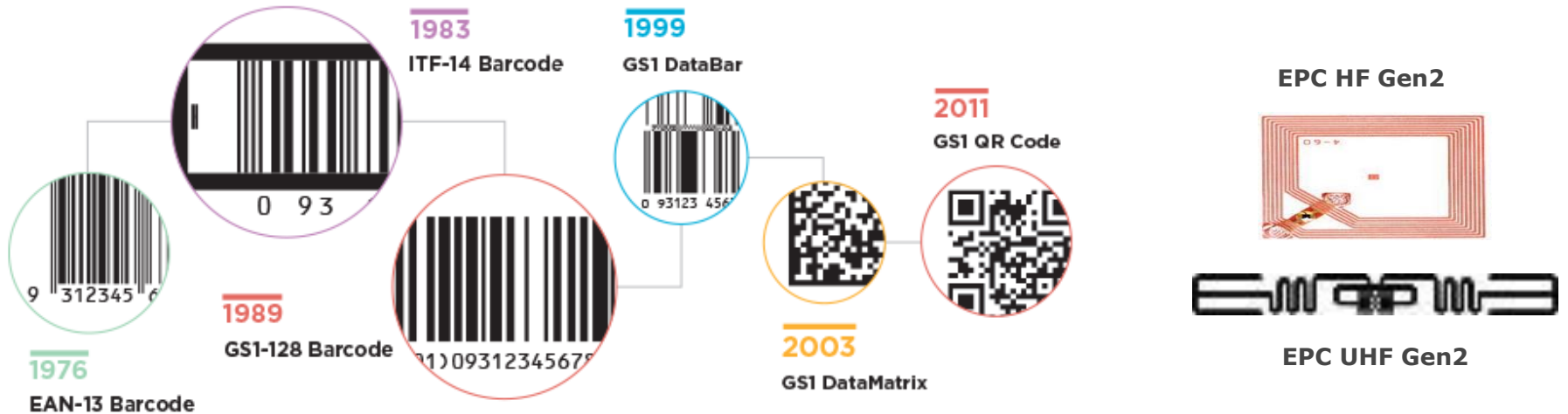


Capture: GS1 data carriers over time

Barcodes

Matrixcodes

RFID



Different GS1 data carriers but same GTIN



AIPI



EAN-13 Barcode



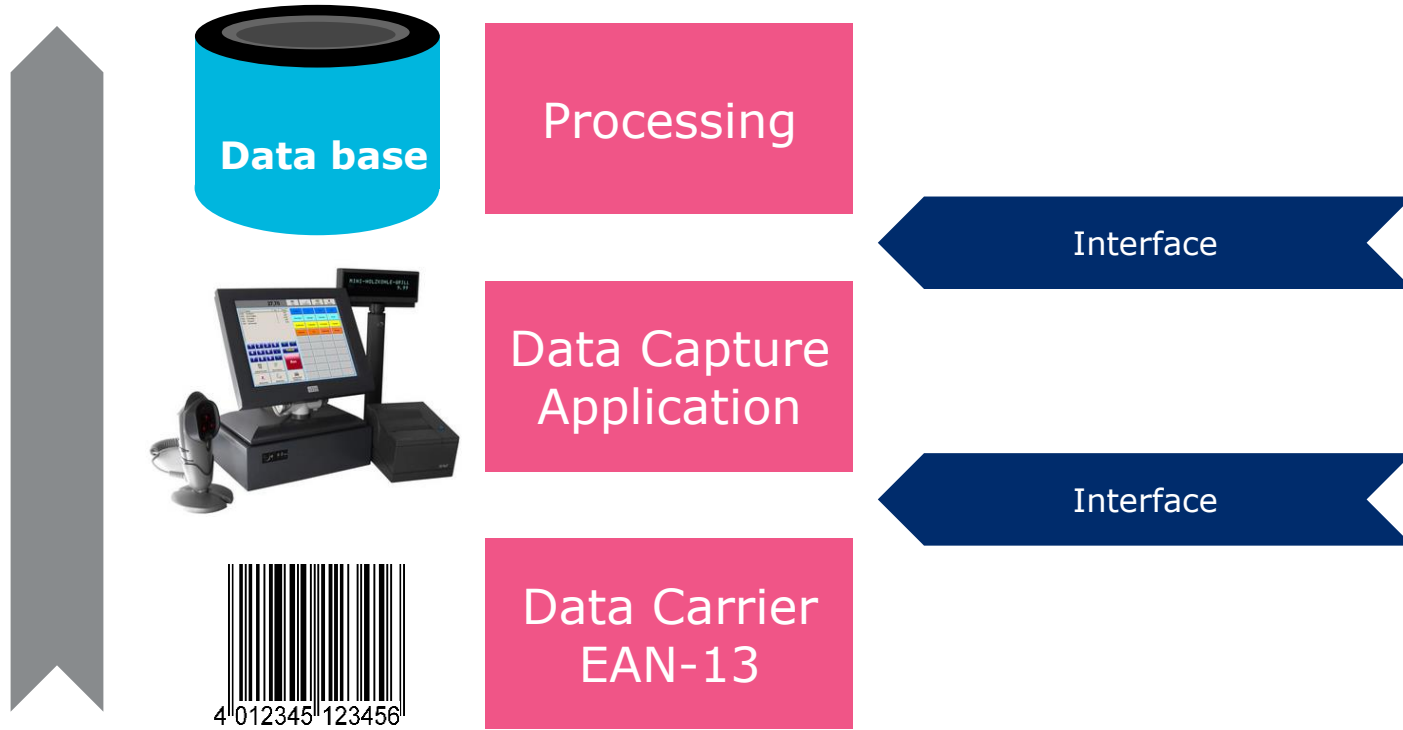
GS1 DataMatrix

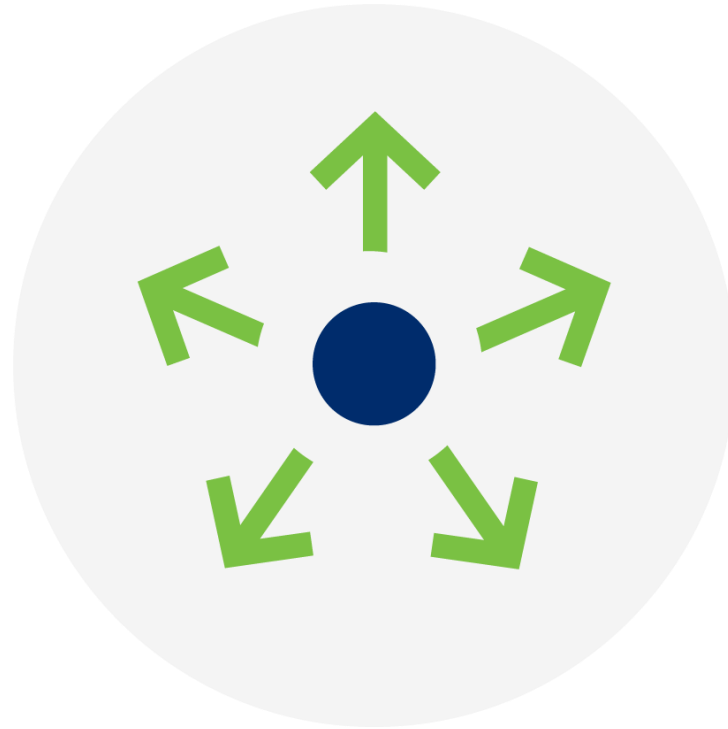


EPC/RFID Tag

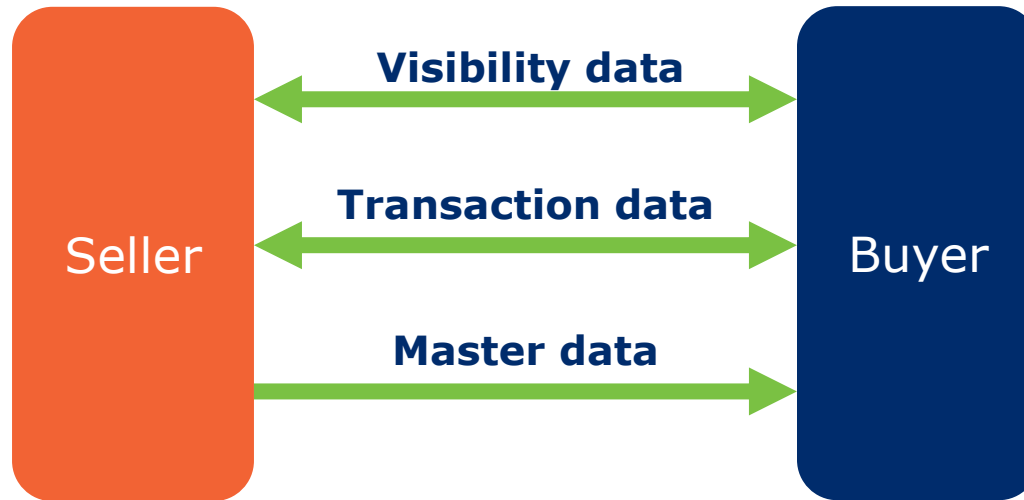
GTIN: 9506000134352

Capture: GS1 data carriers





Share: Three categories of data



What it is

Descriptive attributes of entities identified by GS1 identification keys, including trade items, parties, and physical locations

Different methods to share master data

- Synchronisation in advance => *Global Data Synchronisation Network (GDSN)*
- Peer-to-peer communication in advance => *GS1 XML or EANCOM*
- Query a web page on demand => *GS1 Digital Link + GS1 Web*

2. Transaction Data – Electronic Data Interchange



What it is

Business information required to support a collaborative business process shared bilaterally between organisations

e.g. purchase order, invoice, ...

GS1 Standards for transaction data

- GS1 EANCOM
- GS1 XML



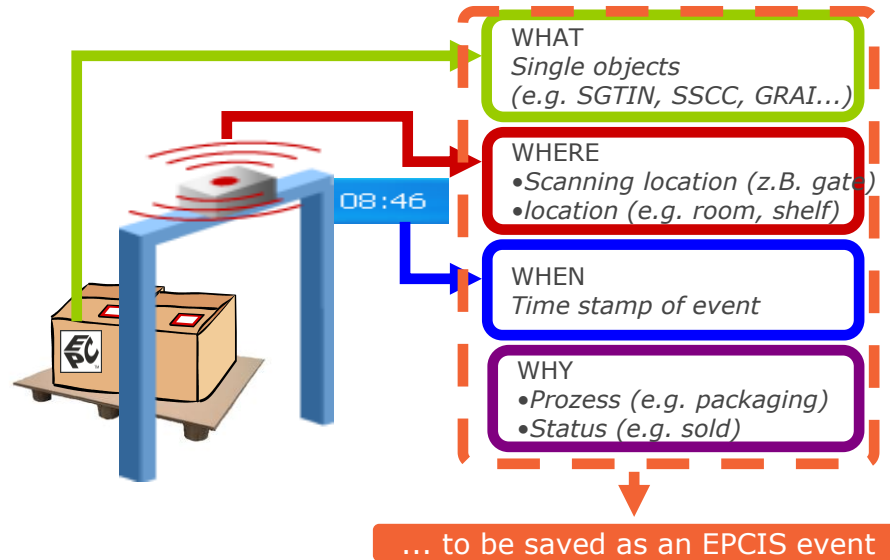
3. Visibility Event Data: EPCIS

What it is

Records of the completion of business process steps in which physical or digital entities are handled

Examples

- Commissioning
- Shipping
- Receiving
- Picking
- Packing
- Transfer at point-of-sale
- destroying





The GS1 Architecture Principles



The purpose of the GS1 Architecture Principles

- To **inform and guide** all those involved in the development and maintenance of the GS1 System
- To provide to users of the GS1 System an insight into the foundational ideas that inform the design of the system

GS1 Architecture Principles set **ideals not diktats**

The twenty GS1 Architecture Principles



1. Business value
2. Conformance
3. Consistency
4. Deprecation
5. Extensibility
6. Forward looking
7. Global multi-sector standards
8. GS1 identification keys
9. Interoperability
10. Non-duplication
11. Non-significance of keys
12. Open supply chains and value networks
13. Re-use of components
14. Royalty free
15. Scalability
16. Security
17. Simplicity
18. Technology independence
19. Third party standards
20. Vision and mission

Deprecation

Every effort should be made to deprecate and ultimately remove obsolete or redundant GS1 system components in support of the principles of interoperability and simplicity.

Non-duplication

The goal of the GS1 System is to establish one and only one way to perform a given function in a GS1 System conformant way.

Therefore, the GS1 System Architecture should avoid duplication.

Royalty free

To the fullest extent possible, ... components shall not require the payment of any type of royalties, fees or other considerations to third parties and shall not impose any conditions or restrictions on the use of any technologies or methods ...