

Basert på use cases fra HSØ

[illegible]

Helse Sør-Øst RHF – HSØ

- Ansvarlig for spesialist helsetjenester til 56% av Norges befolkning
- Byggverk: Forvalter rundt 2.8 million kvadratmeter (BTA)) med bygningsmasse

Støtter buildingSMART og GS1 standarder

- Fokus på Open BIM, fra AHUS-prosjekt i 2003.
- Første regional BIM strategi - basert på Open BIM, i 2011.
- Våre sykehus har vunnet 3 buildingSMART International Awards, både i Design- og Handover kategorien
- Aktiv supporter og deltager i buildingSMART familien
- Strategi for digitalisering og BIM - basert på Open BIM, i 2021



Helse Sør-Øst RHF – HSØ og GS1

Dedikert og engasjert bruk av GS1 standarder

- **Historie:** Har i årvis vært engasjert i byggenæringen for å sikre utbredelse av GS1 standarder
- **Dedikert lederskap:** Har en beslutning fra ledelsen i HSØ på å bruke GS1 standarder
- **Unik identifikator:** GS1 GLN standarden vil være vår felles ID på alle lokasjoner, i alle IT systemer– både kliniske og byggtekniske.
- **Stor implementasjon:** Etablerer mer enn 100 000 lokasjoner (sted, bygning, etasje, sone, rom), med Global Location Number (GLN) som den unike digitale identifikatoren.
- **Publisering:** Gjeldende guidelines for å bruke GS1 standarder for identifikasjon, merking, lokasjoner, etc. er tilgjengelig på GS1 Norway's web-sider.
- **IT-implementering:** I vårt nye FDV system, Omega365 (pilot), implementeres GLN som ID for lokasjoner, GTIN/SGTIN og GIAI som identifikatorer for assets and utstyr. (Project for Digitalisation of Property management in South-Eastern Norway Regional Health Authority).

E-E5-108A
Mal: Romobjekter (Standard mal for IFC typen IFCSPACE)

— Navn og nr	
Name	E-E5-108A
SiV_Romspesifikasjon	1A.9.134.0
SiV_Romtype	1A.9.134 - Sengerom

— Rom: E-E5-108A	
Modellopprinnelse	EDMCatalog_SIV
Instans id.	128849258530
IFC type	IfcSpace
GlobalId	2pjG0DaZr3ihoqk4bmyMCn
Description	2bakYKMYCHxu00h1zhH85Z
ObjectType	
LongName	Sengerom
CompositionType	
PredefinedType	
ElevationWithFlooring	

— LocationInformation	
GLN	7080006025651
Company Name	Sykehuset i Vestfold HF
Location Name	Sengerom, E-E5-108A
Postal Code	3116
City	Tønsberg
Country Code ID	NO
Legal Identifiers	983975250
Address	HALFDA
Telephone	3334200
Location Type	Fysisk lo
Location Status	Aktiv
Company Type	Sykehus

GS1 - A truly global standards organization

The Global Language of Business



120 local Member Organisations



Neutral &
not-for-profit



User-driven
& governed



Global &
local



Inclusive &
collaborative

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

Key industries served



Healthcare



Retail



Marketplaces



General
Merchandise



Apparel



CPG



Fresh Foods



Transport &
Logistics



Foodservice



Technical
Industries



10 billion
GS1 barcodes scanned daily



More than
250 million products
carry GS1 barcode



More than 2 million
companies use GS1 standards

2025 ambition

**GS1 empowers
industry's digital
transformation...**

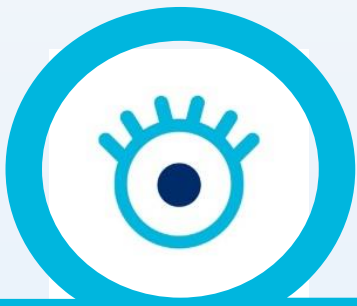
**...to ultimately
benefit consumers
and patients**



Trusted data powered by Global
standards for the digital era!

More sustainable value chains
powered by GS1

Collaboration and innovating for
a better world!



Identify

GS1 Identification Standards

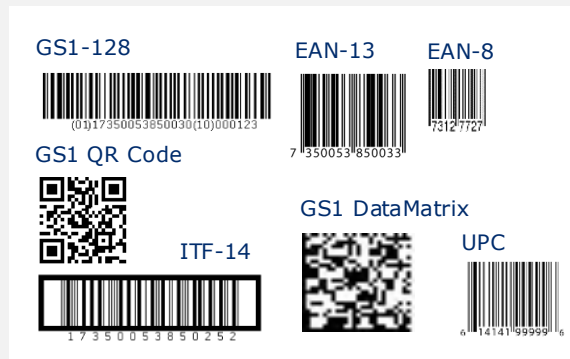
GTIN	Products & Services
GLN	Parties & Locations
SSCC	Logistics Units
GSIN	Shipments
GINC	Consignments
GIAI	Assets
GRAI	Returnable Assets
GSRN	Service Relations



Capture

GS1 Data Carrier Standards

Barcodes



RFID



Share

GS1 Data Sharing Standards



Master Data

Describe things that have a GS1 number

- Products
- Locations



Transaction Data

- Orders
- Shipping Notifications
- Invoices

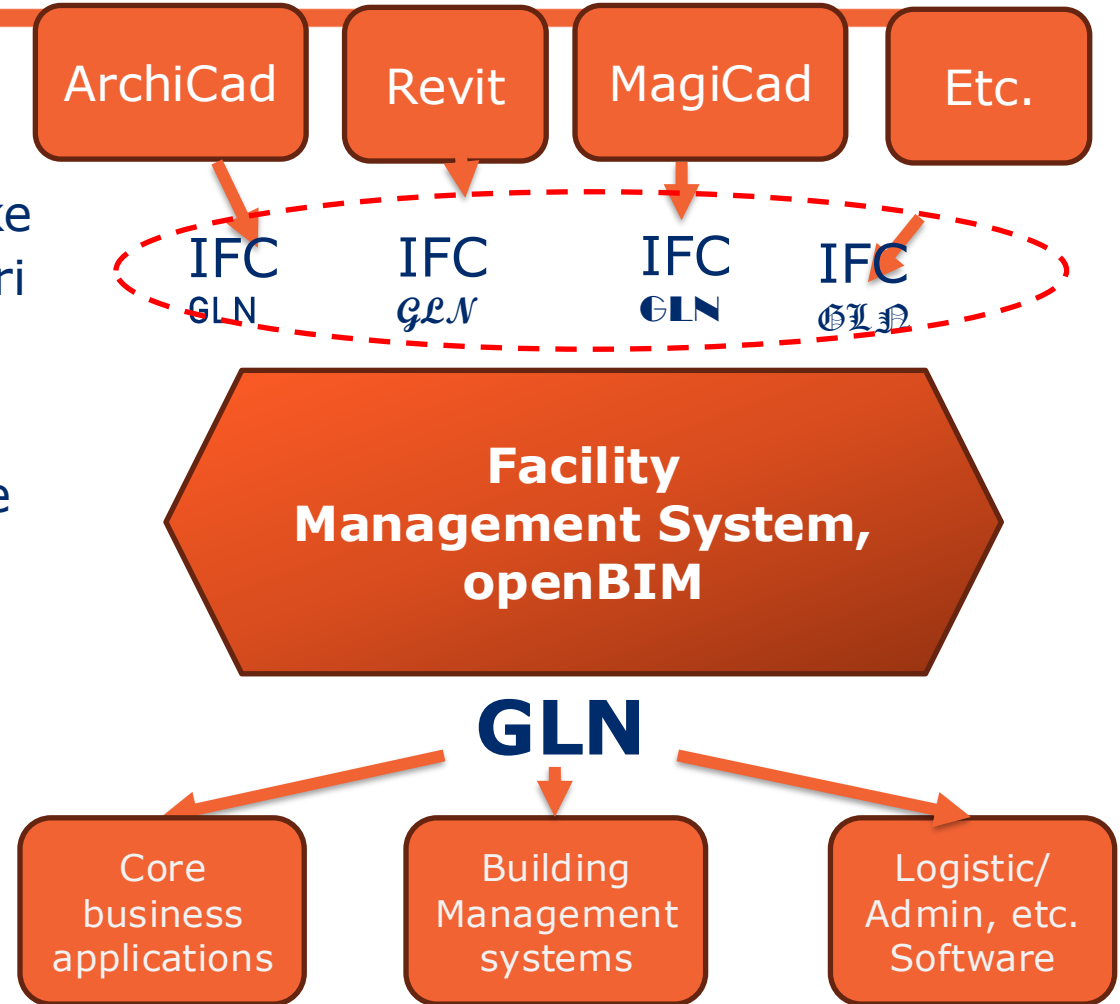


Physical Event Data

Real time traceability event data sharing

Bakgrunn

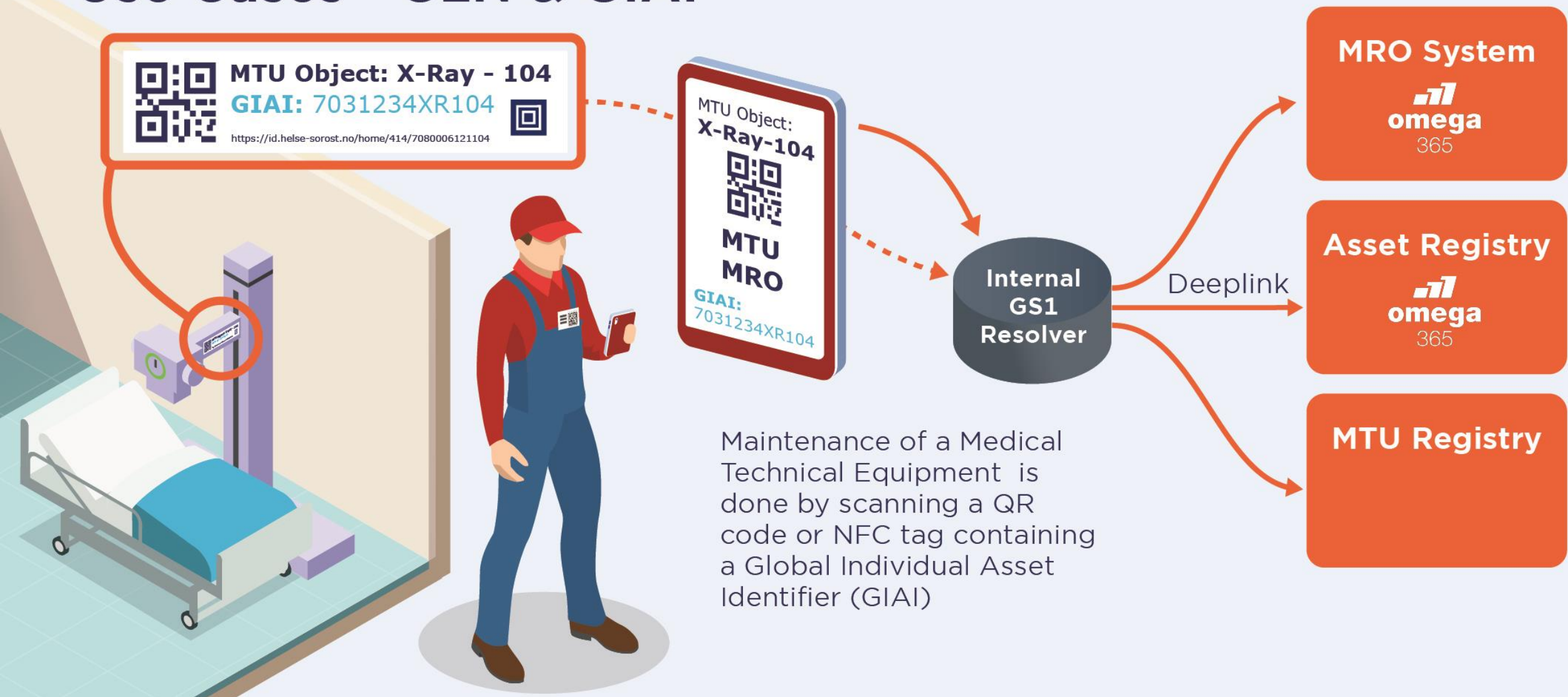
- Problemet:
 - «Vi trenger en mer presis og maskinlesbar og tolkbar definisjon av ID i IFC for å kunne bruke GS1 standarder på en god måte i OpenBIM, Fri tekst felt som i dag, skaper masse arbeid»
- Situasjonen i dag:
 - bare GTIN er gyldig PropertySet i IFC, og bare som fri-tekst felt
 - Custom PropertySets for alle andre GS1 standarder fører til "dialekter"
 - "Umulig" å validere BIM modell for GS1 identifikatorer for produkter, assets og lokasjoner



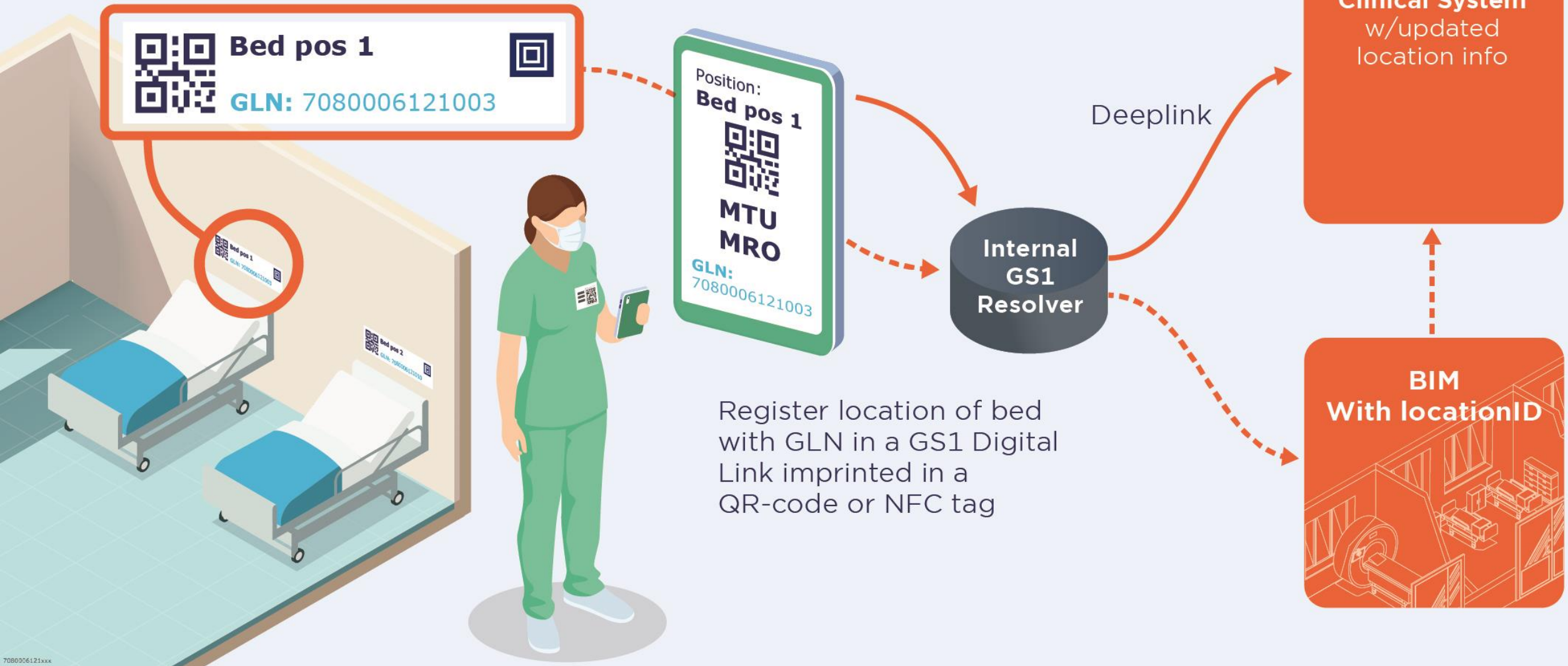
Use Cases - GLN & GIAI



Use Cases - GLN & GIAI

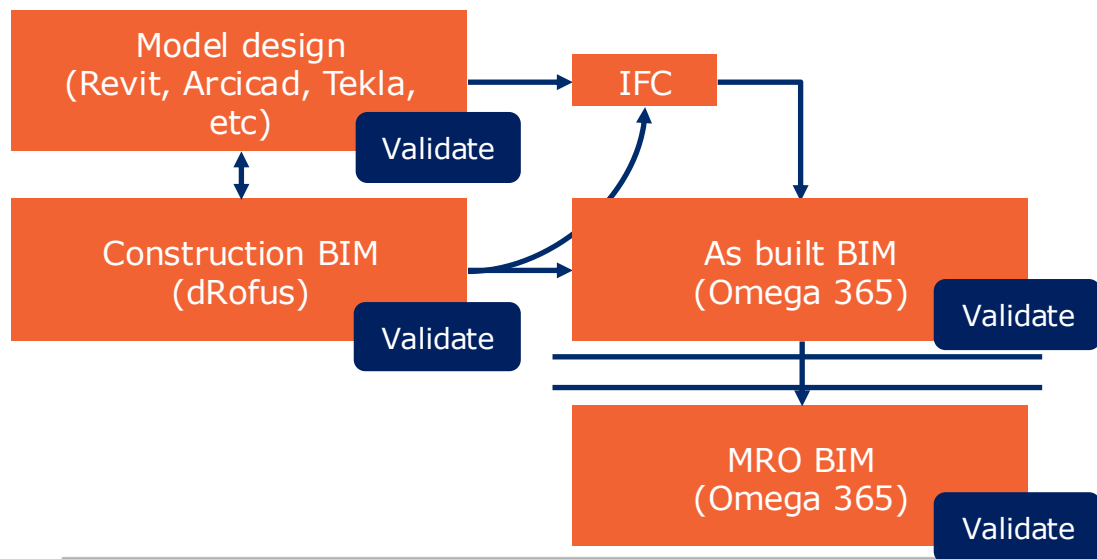


Clinical Use Case



Løsningen– Semantisk validering med bSDD

- BIM modell kan nå valideres for GS1 identifikatorer:
 - I design fasen
 - I byggefasen
 - I leveranse mot spesifikasjon



Groups of properties (3)			
Name	Code	Definition	Identifier (URI)
GS1 Asset Identity	GS1 Asset Identity	Set of GS1 identifiers for unique asset instances.	
GS1 Location Identity	GS1 Location Identity	Set of GS1 identifiers for locations like buildings or rooms.	
GS1 Product Identity	GS1 Product Identity	Set of GS1 identifiers for types of products.	

Properties (7)			
Name	Code	Definition	Identifier (URI)
EPC ID (Electronic Product Code Identification)	EPC ID		
EPC Pure Identity	EPC Pure Identity	A full independent ID representation where all barcodes, RFID tags, GS1 Datamatrix codes and similar...	
GIAI (Global Individual Asset Identifier)	GIAI	Used for the unique identification of individual assets.	
GLN (Global Location Number)	GLN-13	Identifier of locations or parties. It can identify a physical location (like an address, building, ...)	
GS1 Digital Link	GS1 Digital Link	Web URI to encode GS1 data (e.g., GTIN and attribute data) in QR Code or Data Matrix barcodes.	
GTIN (Global Trade Item Number)	GTIN-13	Defines trade items as products or services that are priced, ordered or invoiced at any point in the...	
SGTIN (Serialized Global Trade Item Number)	SGTIN	Identifies each unit of identical products using a combination of a GTIN and a serial numbers (insta...	

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IFC, bSDD and GS1 – how it all fits together

Artur Tomczak, PhD
Technical Product Manager
buildingSMART International

DEFINE TERMS



REFERENCE

SPECIFY NEEDS



DELIVER

STRUCTURE DATA



GTIN (Global Trade Item Number)
GLN (Global Location Number)
GIAI (Global Individual Asset Identifier)
SGTIN (Serialized GTIN)
More...

- Definitions (data dictionary)
- Templates (specifications)
- Identifiers
- Data carriers
- Structured information



- Definitions (data dictionary)



- Templates (specifications)



- Identifiers



- Data carriers



- Structured information



GS1 dictionary in bSDD

URI: <https://identifier.buildingsmart.org/uri/gs1/gs1/0.1>

Dictionary

GS1 Identifiers

Organization
GS1 (demonstration)

License
Not provided

Version 0.1.0

Preview

This dictionary has status **Preview**.
The content might change and is not ready to be used as a reference.
[Read more about statuses →](#)

GS1 (demonstration) > GS1 Identifiers > 0.1.0

Dictionary

Name

GS1 Identifiers

Dictionary code

gs1

Version

0.1.0

Identifier (URI)

<https://identifier.buildingsmart.org/uri/gs1/gs1/0.1.0>

Copy

More info

<https://www.gs1.org/>

Organization

GS1 (demonstration)

Organization code

gs1

Classes (0)

Materials (0)

Properties (7) Filter properties

Name	Code	Definition	Identifier (URI)
EPC ID (Electronic Product Code Identification)	EPC ID		
EPC Pure Identity	EPC Pure Identity	A full independent ID representation where all barcodes, RFID tags, GS1 Datamatrix codes and similar...	
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Items per page: 10 1 - 7 of 7

Groups of properties (3) Filter groups of properties

Name	Code	Definition	Identifier (URI)
GS1 Asset Identity	GS1 Asset Identity	Set of GS1 identifiers for unique asset instances.	
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Items per page: 10 1 - 3 of 3

GS1 dictionary in bSDD

URI: <https://identifier.buildingsmart.org/uri/gs1/gs1/0.1.0/prop/GIAI>

GS1 (demonstration) > GS1 Identifiers > 0.1.0 > GIAI (Global Individ...

Property

English

Download as

Change request

Name

GIAI (Global Individual Asset Identifier)

Code

GIAI

Copy

Identifier (URI)

https://identifier.buildingsmart.org/uri/gs1/gs1/0.1.0/prop/GIAI

Copy

Definition

Used for the unique identification of individual assets.

Description

Must follow format: N4+X..30

Data type

String

Value kind

Single

Text format

Units

QUDT codes

Example

1234ABCDEFGFG567890

Dimension

Pattern

\d{4}[^\s]{0,30}

Show less

Show less ^



-
- Definitions (data dictionary)



- Templates (specifications)



- **Identifiers**



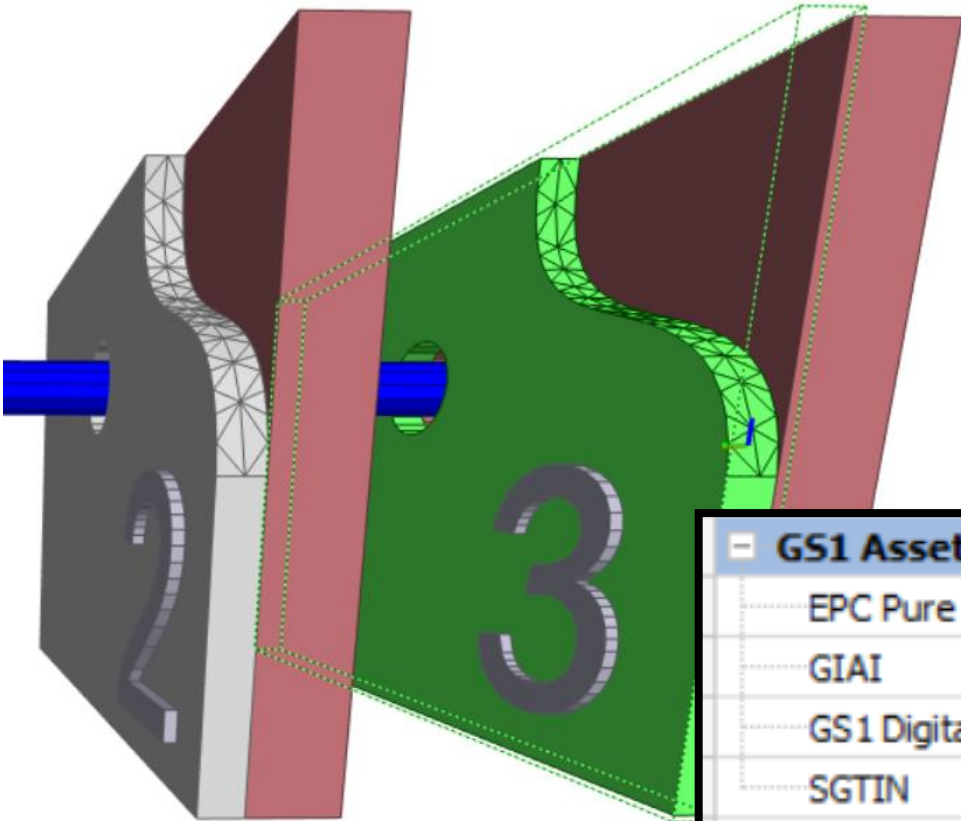
- Data carriers



- **Structured information**



IFC data



IFC structure			
Active	Type	Name	
☒	Project	Project Number	
☒	Site	Default	
☒	Building		
☒	Building Storey	Level 0	
☒	Walls		
☒	Wall	Basic Wall:20cm wall + 10cm insulation:722755	
☒	Wall	Basic Wall:20cm wall + 10cm insulation:724747	
☒	Wall	Walls Assembly:Wall:726122	
☒	Wall	Basic Wall:20cm wall:725684	
☒	Covering	Basic Wall: 10cm insulation:725892	
	Wall type	Walls Assembly:Wall	

Properties	Location	Classification	Relations
Name		Value	
Element Specific			
Guid	2d2a9tINDEQvSnqWksvGPK		
IfcEntity	IfcCovering		
Name	Basic Wall: 10cm insulation:725892		
ObjectType	Basic Wall:10cm insulation		

GS1 Asset Identity	
EPC Pure Identity	urn:epc:id:sgtin:0107332402026594211234567832
GIAI	1234ABCDEFGFG567832
GS1 Digital Link	https://id.gs1.org/01/09520123456732
SGTIN	0107332402026594211234567832
GS1 Product Identity	
GTIN-13	7332402026593

EXAMPLE

- Definitions (data dictionary)



- **Templates (specifications)**



- **Identifiers**



- Data carriers



- Information



GS1 specification in IDS

Product Identification

PROPERTY **GTIN-13** of Property Set **GS1 Product Identity** with a value of exact length equal to **13**



PROPERTY **SGTIN** of Property Set **GS1 Asset Identity** with a value matching the pattern **010\d{13-80}**

PROPERTY **GIAI** of Property Set **GS1 Asset Identity** with a value matching the pattern **\d{4}[^s]{0,30}**

PROPERTY **EPC ID** of Property Set **GS1 Asset Identity**

PROPERTY **EPC Pure Identity** of Property Set **GS1 Asset Identity** with a value matching the pattern **urn:epc:id:sgtin:**

PROPERTY **GS1 Digital Link** of Property Set **GS1 Asset Identity** with a value matching the pattern **https://vid.gs1.org/.***



Location Identification

PROPERTY **GLN-13** of Property Set **GS1 Location Identity** with a value of exact length equal to **13**



GS1 specification in IDS

```
<ids:specification ifcVersion="IFC4X3_ADD2" name="Location identification" identifier="Ident-03" description="All locations require an identifier.">  
  <ids:applicability minOccurs="1" maxOccurs="unbounded">  
    <ids:entity>  
      <ids:name>  
        <xs:restriction base="xs:string">  
          <xs:enumeration value="IFCSpace" />  
          <xs:enumeration value="IFCBUILDINGSTOREY" />  
          <xs:enumeration value="IFCFACILITY" />  
          <xs:enumeration value="IFCSITE" />  
          <xs:enumeration value="IFCBRIDGE" />  
          <xs:enumeration value="IFCBUILDING" />  
          <xs:enumeration value="IFCMARINEFACILITY" />  
          <xs:enumeration value="IFCRAILWAY" />  
          <xs:enumeration value="IFCPAD" />  
        </xs:restriction>  
      </ids:name>  
      <ids:uri uri="https://identifier.buildingsmart.org/uri/gsl/gsl/0.1.0/prop/GLN-13">  
      </ids:uri>  
    </ids:entity>  
  </ids:applicability>  
  <ids:requirements>  
    <ids:property cardinality="required" dataType="IFCLABEL" uri="https://identifier.buildingsmart.org/uri/gsl/gsl/0.1.0/prop/GLN-13">  
      <ids:propertySet>  
        <ids:propertySet>  
          <ids:value>  
            <ids:simpleValue><b>GS1 Location Identity</b></ids:simpleValue>  
          </ids:value>  
        </ids:propertySet>  
      </ids:propertySet>  
    </ids:property>  
  </ids:requirements>  
  <ids:names>  
    <ids:value>  
      <ids:simpleValue><b>GLN-13</b></ids:simpleValue>  
    </ids:value>  
  </ids:names>  
</ids:specification>
```

IFC-IDS checking

Basic Wall:20cm wall + 10cm insulation:722755

Part:723841

Part:724489

Pipe Types:fi150:722756

Basic Wall:20cm wall + 10cm insulation:724747

Basic Wall:20cm wall + 10cm insulation:398

Walls Assembly:Wall:726122

Basic Wall:20cm wall:725684

Basic Wall:20cm wall:725792

Basic Wall:10cm insulation:725892

3/13

Part:724489

PropertySets

GS1 Product Identity

GTIN-13

This property is missing

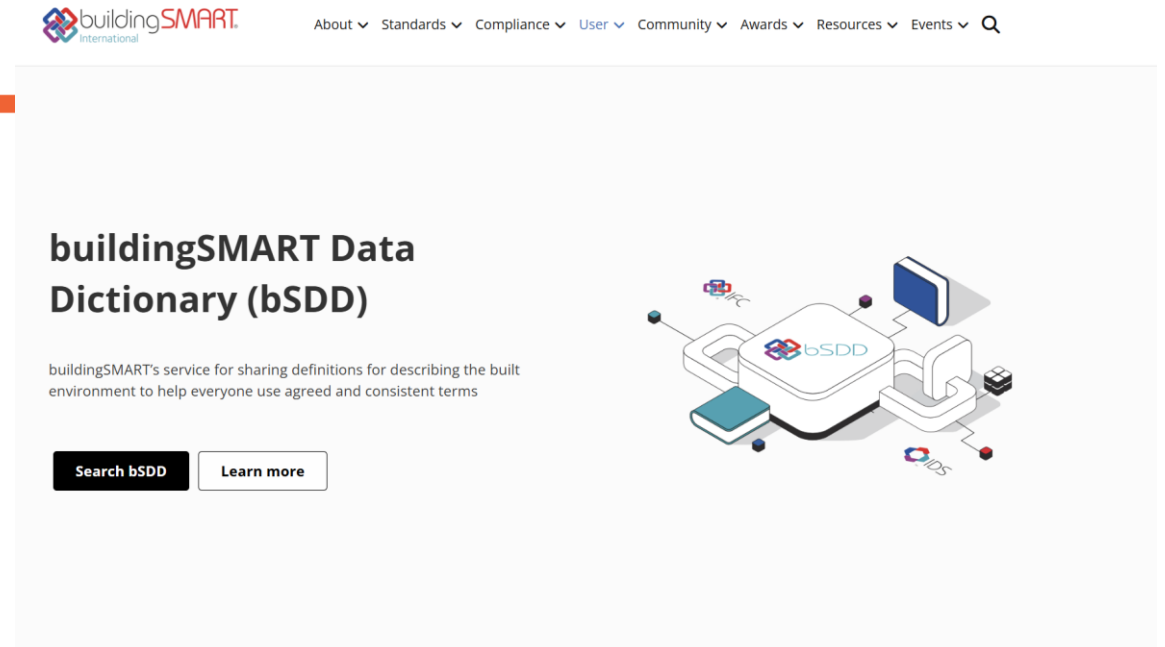
How to start using bSDD?

Use existing content:

- Find tools that integrate with bSDD, or browse the bSDD Search page
- Find the terms you need*
- Specify in IDS and apply in IFC data

Add missing content:

- Register your organisation
- Prepare the data dictionary (template)
- Upload to bSDD



What is bSDD?

About Content Purpose



bSDD is a collection of interconnected data dictionaries with definitions of terms to describe the built environment. The service is provided by buildingSMART for free, to enable easy access from all software solutions.

The content is published by independent organisations, spanning international classifications, national standards and company-specific agreements.

Get familiar

Where bSDD is today

- API first tool, but also bSI's UI: Search and Manage pages
- Maintenance mode, continues development
- Growing use and publication of data (year-to-year):
 - +88 dictionaries (+32%),
 - +3100 daily users* (+535%),
 - +12 integrations (+63%)
- Secure long-term bSDD future, pending Technical Roadmap update
- IFCX has an impact on bSDD, pending the project development

IFC, bSDD and GS1 – how it all fits together

Artur Tomczak, PhD
Technical Product Manager
buildingSMART International

DEFINE TERMS



REFERENCE

SPECIFY NEEDS



DELIVER

STRUCTURE DATA



GTIN (Global Trade Item Number)
GLN (Global Location Number)
GIAI (Global Individual Asset Identifier)
SGTIN (Serialized GTIN)
More...

- Definitions (data dictionary)



- Templates (specifications)



- Identifiers



- Data carriers



- Structured information



- Definitions (data dictionary)



- Templates (specifications)



- Identifiers



- Data carriers



- Structured information



GS1 dictionary in bSDD

URI: <https://identifier.buildingsmart.org/uri/gs1/gs1/0.1.0>

GS1 (demonstration) > GS1 Identifiers > 0.1.0

Dictionary

GS1 Identifiers

Organization
GS1 (demonstration)

License
Not provided

Version 0.1.0  Preview

This dictionary has status **Preview**.
The content might change and is not ready to be used as a reference.

[Read more about statuses →](#)

Dictionary

Name **GS1 Identifiers**

Dictionary code gs1

Version 0.1.0

Identifier (URI) <https://identifier.buildingsmart.org/uri/gs1/gs1/0.1.0> 

More info <https://www.gs1.org/>

Organization GS1 (demonstration)

Organization code gs1

 **Classes (0)**

 **Materials (0)**

 **Properties (7)**  Filter properties 

Name	Code	Definition	Identifier (URI)
 EPC ID (Electronic Product Code Identification)	EPC ID		
 EPC Pure Identity	EPC Pure Identity	A full independent ID representation where all barcodes, RFID tags, GS1 Datamatrix codes and similar...	
 GIAI (Global Individual Asset Identifier)	GIAI	Used for the unique identification of individual assets.	
 GLN (Global Location Number)	GLN-13	Identifier of locations or parties. It can identify a physical location (like an address, building, ...)	
 GS1 Digital Link	GS1 Digital Link	Web URI to encode GS1 data (e.g., GTIN and attribute data) in QR Code or Data Matrix barcodes.	
 GTIN (Global Trade Item Number)	GTIN-13	Defines trade items as products or services that are priced, ordered or invoiced at any point in the...	
 SGTIN (Serialized Global Trade Item Number)	SGTIN	Identifies each unit of identical products using a combination of a GTIN and a serial numbers (insta...	

Items per page: 10 1 - 7 of 7    

 **Groups of properties (3)**  Filter groups of properties 

Name	Code	Definition	Identifier (URI)
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Items per page: 10 1 - 3 of 3    

GS1 dictionary in bSDD

URI: <https://identifier.buildingsmart.org/uri/gs1/gs1/0.1.0/prop/GIAI>

GS1 (demonstration) > GS1 Identifiers > 0.1.0 > GIAI (Global Individ...

Property

EnglishDownload asChange request

Name	GIAI (Global Individual Asset Identifier)	
Code	GIAI	Copy
Identifier (URI)	https://identifier.buildingsmart.org/uri/gs1/gs1/0.1.0/prop/GIAI	Copy
Definition	Used for the unique identification of individual assets.	
Description	Must follow format: N4+X..30	
Data type	String	
Value kind	Single	
Text format		
Units		
QUDT codes		
Example	1234ABCDEFGFG567890	
Dimension		
Pattern	\d{4}[^s]{0,30}	

Show less ^

- Definitions (data dictionary)



- Templates (specifications)



- Identifiers



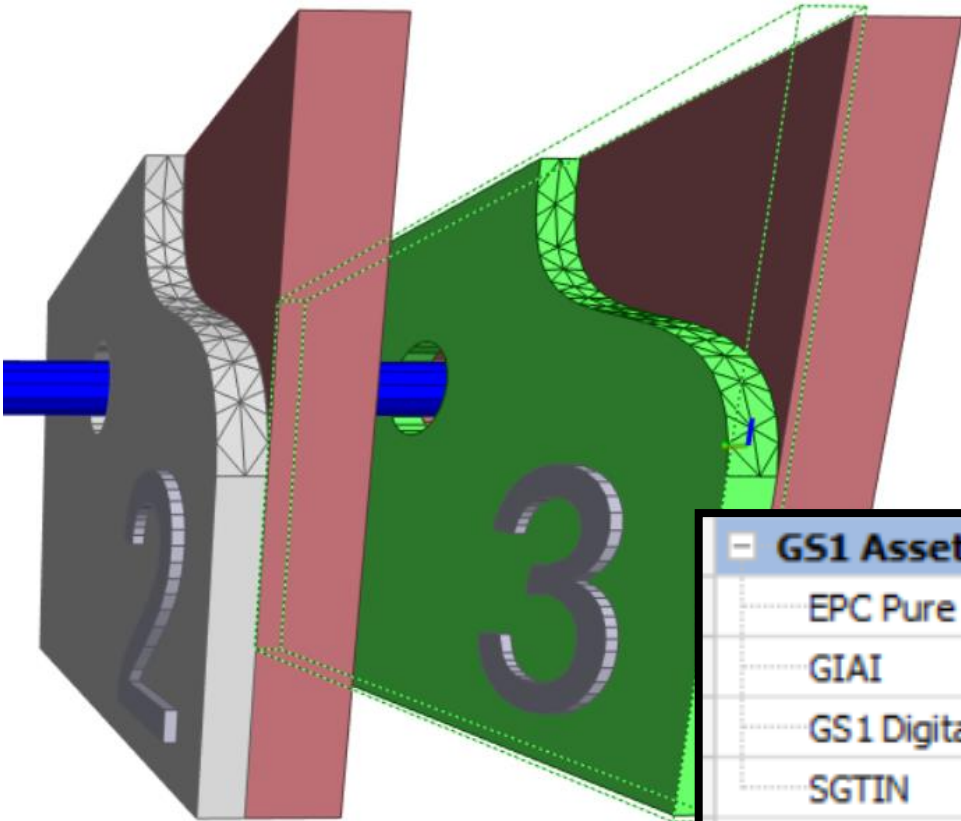
- Data carriers



- Structured information



IFC data



IFC structure			
Active	Type	Name	
☒	Project	Project Number	
☒	Site	Default	
☒	Building		
☒	Building Storey	Level 0	
☒	Walls		
☒	Wall	Basic Wall:20cm wall + 10cm insulation:722755	
☒	Wall	Basic Wall:20cm wall + 10cm insulation:724747	
☒	Wall	Walls Assembly:Wall:726122	
☒	Wall	Basic Wall:20cm wall:725684	
☒	Covering	Basic Wall: 10cm insulation:725892	
☒	Wall type	Walls Assembly:Wall	

.....

Properties	Location	Classification	Relations
Name		Value	
Element Specific			
Guid	2d2a9tINDEQvSnqWksvGPK		
IfcEntity	IfcCovering		
Name	Basic Wall: 10cm insulation:725892		
ObjectType	Basic Wall:10cm insulation		

GS1 Asset Identity	
EPC Pure Identity	urn:epc:id:sgtin:0 107332402026594211234567832
GIAI	1234ABCDEFGFG567832
GS1 Digital Link	https://id.gs1.org/01/09520123456732
SGTIN	0107332402026594211234567832
GS1 Product Identity	
GTIN-13	7332402026593

EXAMPLE

- Definitions (data dictionary)



- Templates (specifications)



- Identifiers



- Data carriers



- Information



GS1 specification in IDS

Product Identification	
PROPERTY GTIN-13 of Property Set GS1 Product Identity with a value of exact length equal to 13	
Location Identification	
PROPERTY SGTIN of Property Set GS1 Asset Identity with a value matching the pattern 010\d{13-80}	
PROPERTY GIAI of Property Set GS1 Asset Identity with a value matching the pattern \d{4}[^s]{0,30}	
PROPERTY EPC ID of Property Set GS1 Asset Identity	
PROPERTY EPC Pure Identity of Property Set GS1 Asset Identity with a value matching the pattern urn:epc:id:sgtin:	
PROPERTY GS1 Digital Link of Property Set GS1 Asset Identity with a value matching the pattern https://vid.gs1.org/.*	
Location Identification	
PROPERTY GLN-13 of Property Set GS1 Location Identity with a value of exact length equal to 13	

GS1 specification in IDS

```
<ids:specification ifcVersion="IFC4X3_ADD2" name="Location identification" identifier="Ident-03" description="All locations require an identifier.">
  <ids:applicability minOccurs="1" maxOccurs="unbounded">
    <ids:entity>
      <ids:name>
        <xs:restriction base="xs:string">
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          <xs:enumeration value="IFCBUILDINGSTOREY" />
          <xs:enumeration value="IFCFACILITY" />
          <xs:enumeration value="IFCSITE" />
          <xs:enumeration value="IFCBRIDGE" />
          <xs:enumeration value="IFCBUILDING" />
          <xs:enumeration value="IFCMARINEFACILITY" />
          <xs:enumeration value="IFCRAILWAY" />
          <xs:enumeration value="IFCSPACE" />
        </xs:restriction>
      </ids:name>
      <ids:uri uri="https://identifier.buildingsmart.org/uri/gs1/gs1/0.1.0/prop/GLN-13">
      </ids:uri>
    </ids:entity>
  </ids:applicability>
  <ids:requirements>
    <ids:property cardinality="required" dataType="IFCLABEL" uri="https://identifier.buildingsmart.org/uri/gs1/gs1/0.1.0/prop/GLN-13">
      <ids:propertySet>
        <ids:entity>
          <ids:entityValue>GS1 Location Identity</ids:entityValue>
        </ids:entity>
      </ids:propertySet>
    </ids:property>
  </ids:requirements>
  <ids:entity>
    <ids:entityValue>GLN-13</ids:entityValue>
  </ids:entity>
</ids:specification>
```

IFC-IDS checking

Home > I... > Product identification

Basic Wall:20cm wall + 10cm insulation:722755

Part:723841

Part:724489

Pipe Types:fi150:722756

Basic Wall:20cm wall + 10cm insulation:724747

Basic Wall:20cm wall + 10cm insulation:398

Walls Assembly:Wall:726122

Basic Wall:20cm wall:725684

Basic Wall:20cm wall:725792

Basic Wall:10cm insulation:725892

3/13

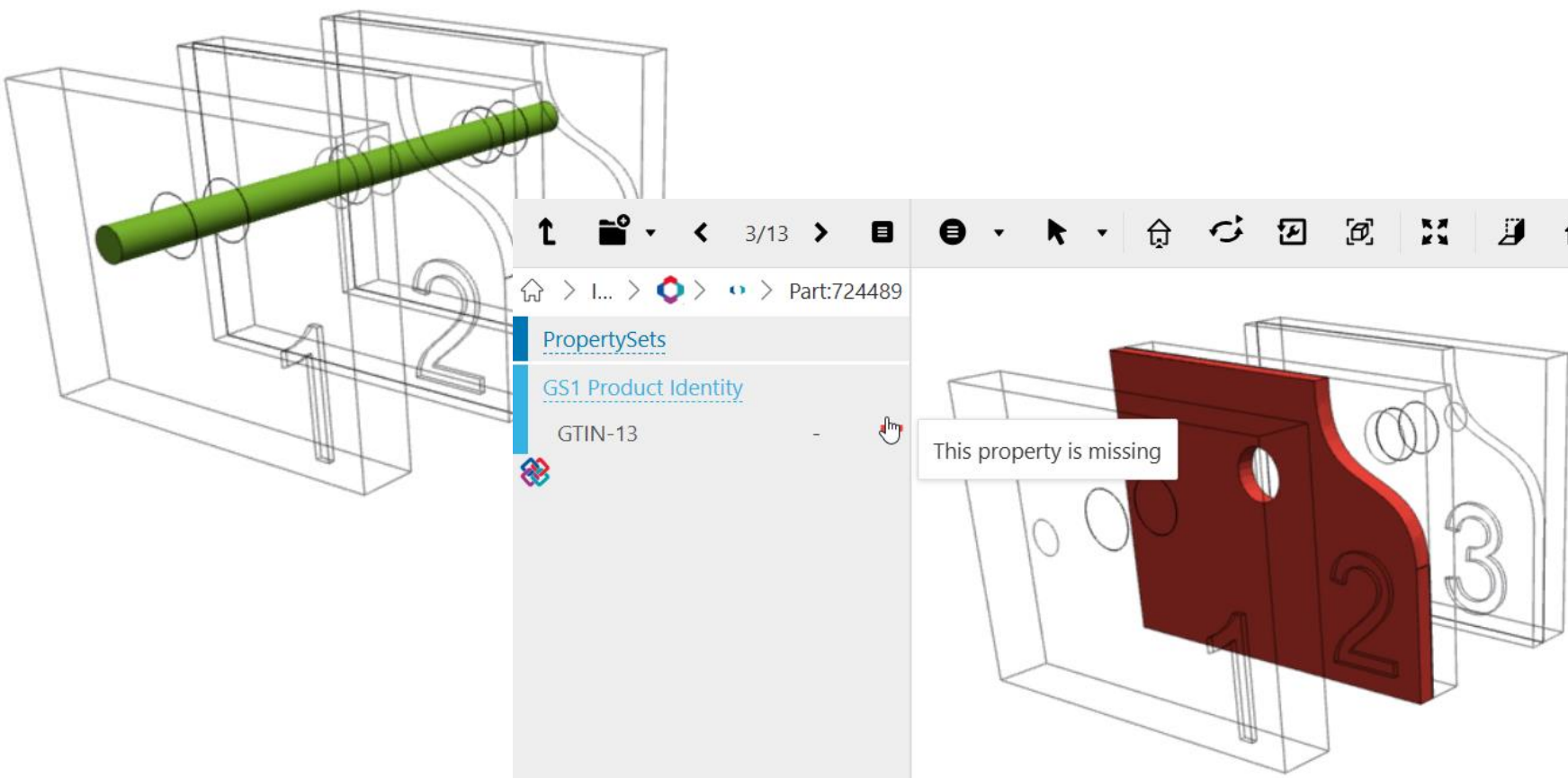
Home > I... > Part:724489

PropertySets

GS1 Product Identity

GTIN-13

This property is missing



The image shows a 3D model of a wall assembly. A green pipe is shown passing through the wall. The wall is composed of several layers, including insulation and structural walls. A red section of the wall is highlighted, and a tooltip indicates that a property is missing. The interface includes a left sidebar with a list of components and their IDs, a top navigation bar, and a right sidebar with a list of property sets and a tooltip.

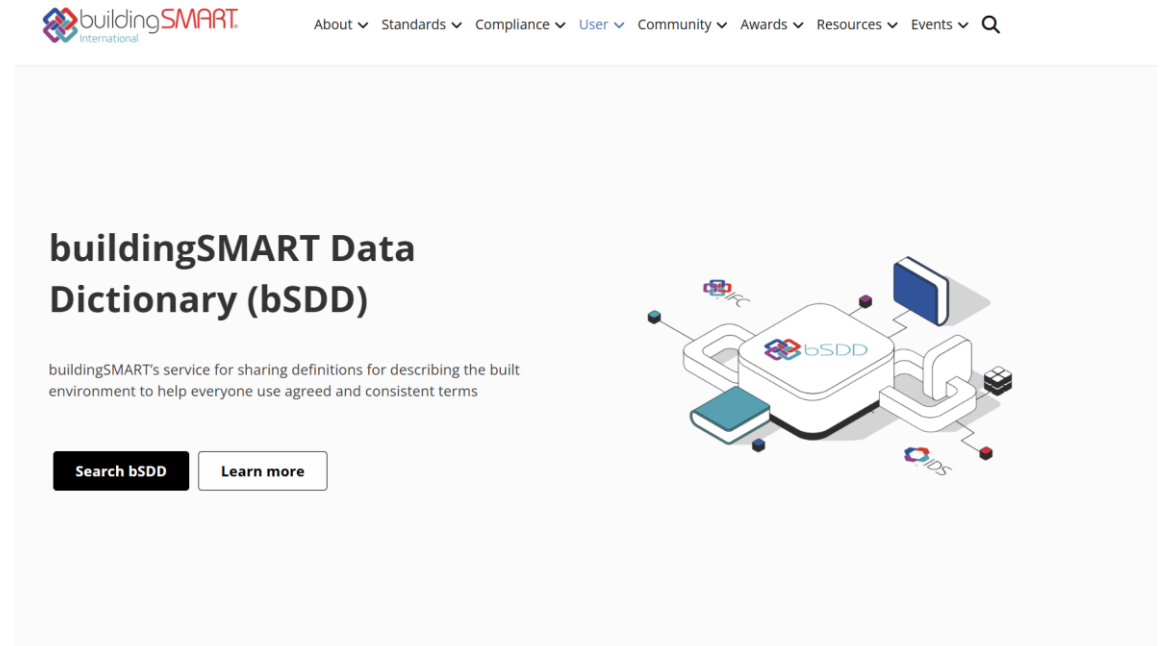
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Use existing content:

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- Find the terms you need*
- Specify in IDS and apply in IFC data

Add missing content:

- Register your organisation
- Prepare the data dictionary (template)
- Upload to bSDD



What is bSDD?



About Content Purpose

bSDD is a collection of interconnected data dictionaries with definitions of terms to describe the built environment. The service is provided by buildingSMART for free, to enable easy access from all software solutions.

The content is published by independent organisations, spanning international classifications, national standards and company-specific agreements.

Get familiar

Where bSDD is today

- API first tool, but also bSI's UI: Search and Manage pages
- Maintenance mode, continues development
- Growing use and publication of data (year-to-year):
 - +88 dictionaries (+32%),
 - +3100 daily users* (+535%),
 - +12 integrations (+63%)
- Secure long-term bSDD future, pending Technical Roadmap update
- IFCX has an impact on bSDD, pending the project development