How new regulations will impact digital processes in the construction industry

buildingSMART Norge-konferansen, 11.04.2024

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Espen Schulze

Group VP Research, Cobuilder

- Expert in numerous standardization projects in CEN and ISO
- Project leader of
  - EN ISO 23387 - Data templates
  - WI 00442051 - Methodology for CEN TCs
- Member of buildingSMART Product Domain Steering Committee

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A European Green Deal

Striving to be the first climate-neutral continent

Climate change is the biggest challenge of our times.
And it is an opportunity to build a new economic model.

European Commission

A European Green Deal

Striving to be the first climate-neutral continent

The updated EU Industrial Strategy

Swift green and digital transition of EU industry and its ecosystems

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*The **Construction Products Regulation** provides the necessary instruments and will ensure the exchange of compatible data in BIM systems. To achieve this goal the current CPR allows the declaration using human and machine-readable information and the future CPR is expected to provide a database or system to be used as data source for the assessment of buildings…..*

*From a more global perspective, the work of **CEN/TC 442** dealing with BIM is another key element able to ensure a homogeneous implementation across Europe. Issues such as language, different construction traditions and terminology, process and regulatory approaches need to be taken into consideration for the development of European standards related to BIM. At the same time, the pressure of global players to impose their own solutions needs to be assessed to ensure a level playing field in the virtual world.*

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Information management systems, product data. *The BIM standards developed for Construction and infrastructure to digitise products, EN ISO 23386 & EN ISO 23387. Also, the standard for digitising Environmental Product Declarations (EPD) that is using the above-mentioned standards is relevant. This is also relevant for EU legal framework of REACH, CPR, LVD, MD etc. as the use of machine-readable Data Templates (EN ISO 23387) support the use of harmonised European Norms (product standards/test standards).*

The publication of the international standard EN ISO 22057 on data templates of the use of environmental product declarations (EPDs) provides a clear signal of the importance of the worldwide markets in this field.

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(New) Construction Products Regulation

Implementing digitalization through the use of **data dictionary** and **machine-readable format**

It is necessary to establish well-functioning information flows, including via electronic means and in a machine-readable format
Whereas: (4)

*To improve machine readability, it is necessary to establish **a common data dictionary** based on European standards, a tool to govern and publish the data structure and their meaningful definitions and descriptions for all relevant construction products. For each product family or category, the data dictionary should include all the essential characteristics and other properties as set out in the harmonised technical specifications as well as other information required according to this regulation. A data dictionary harmonised at the EU level allows for the classification and use of structured definitions by both competent national authorities and in the further digitalisation of the construction sector, in particular in Building Information Modelling, building logbooks, digital passports and registries.*
Whereas: (84a)

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(New) Construction Products Regulation

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Digital Product Passport

(including Declaration of Performance/Conformity)

Article 81a
Construction digital product passport system

The construction digital product passport system shall:

- *be compatible, interoperable and built on the digital product passport established by the regulation (EU) .../... [Regulation on eco design for sustainable products], without compromising interoperability with Building Information Modelling (BIM) while taking into account the specific characteristics and requirements related to construction products;*

Article 81c
General requirements for the product passport

all information included in the product passport shall be based on open standards, developed with an interoperable format and shall be, as appropriate, machine-readable, structured, searchable and transferable through an open interoperable data exchange network without vender lock-in

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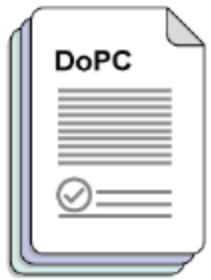
DPP content



Declaration of performance and conformity

General product information, instructions for use and safety information

Technical documentation

Label (when applicable)

Unique product identifier
dpp:GTIN:**3234567890126**

Unique operator identifier
dpp:VAT:**AT U14589505**

Unique facility identifier
dpp:ISO3166-2:**BE**

Data carriers

European Commission

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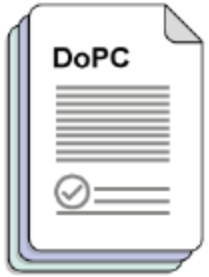
DPP content

Product data



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BIM standardization

TC 442

TC 59

BIM standardization

TC 442

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Standards supporting data dictionaries

TC 442

TC 59

EN ISO 23386

EN ISO 12006-3

EN ISO 23387

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Standards supporting data dictionaries

TC 442

TC 59

Describe, author and maintain properties

EN ISO 23386

Data model for data dictionaries

EN ISO 12006-3

Data templates

EN ISO 23387

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EN ISO 23386

EN ISO 23386

Property attributes

globally unique identifier
Status
Date of creation
Date of activation
Date of last change
Date of revision
Date of version
Date of deactivation
Version number
Revision number
List of replaced properties
List of replacing properties
Deprecation explanation
Relation of the property identifiers in the interconnected data dictionaries
Creator’s language
Names in language N
Definitions in language N
Descriptions in language N
Examples in language N
Connected properties
Symbols of the property in a given property group
Visual representation
Country of use
Subdivision of use
Country of origin
Physical quantity
Dimension
Method of measurement
Data Type
Dynamic property
Parameters of the dynamic property
Units
Name of the defining values
Defining Values
Tolerance
Digital format
Text format
List of possible values in language N
Boundary values

Group of properties attributes

globally unique identifier
Status
Date of creation
Date of activation
Date of last change
Date of revision
Date of version
Date of deactivation
Version number
Revision number
List of replaced groups
LIst of replacing groups
Relation of the group of properties identifiers in the interconnected data dictionaries
Deprecation explanation
Creator’s language
Names in language
Definitions in language N
Visual representation
Country of use
Subdivision of use
Country of origin
Category of group of properties
parent group of properties

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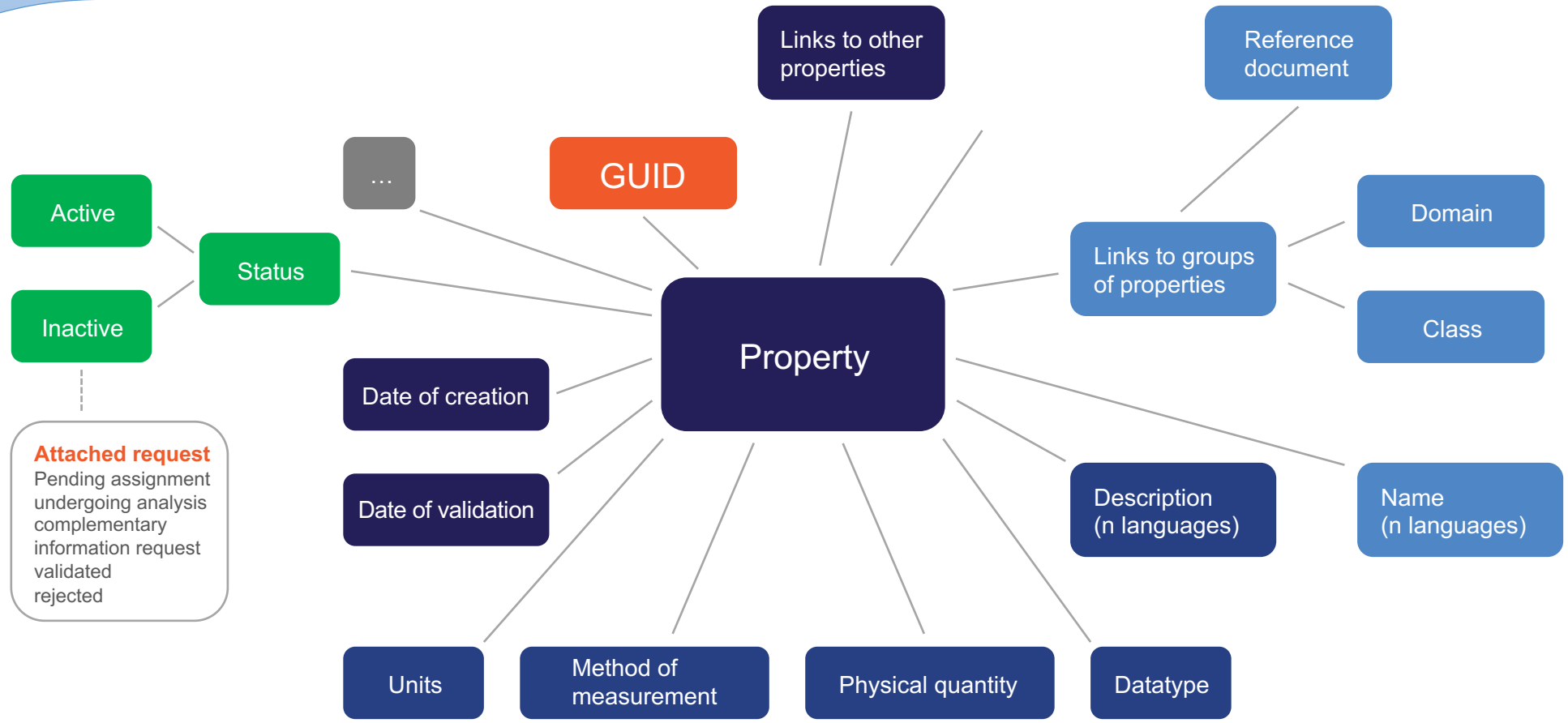
EN ISO 23386



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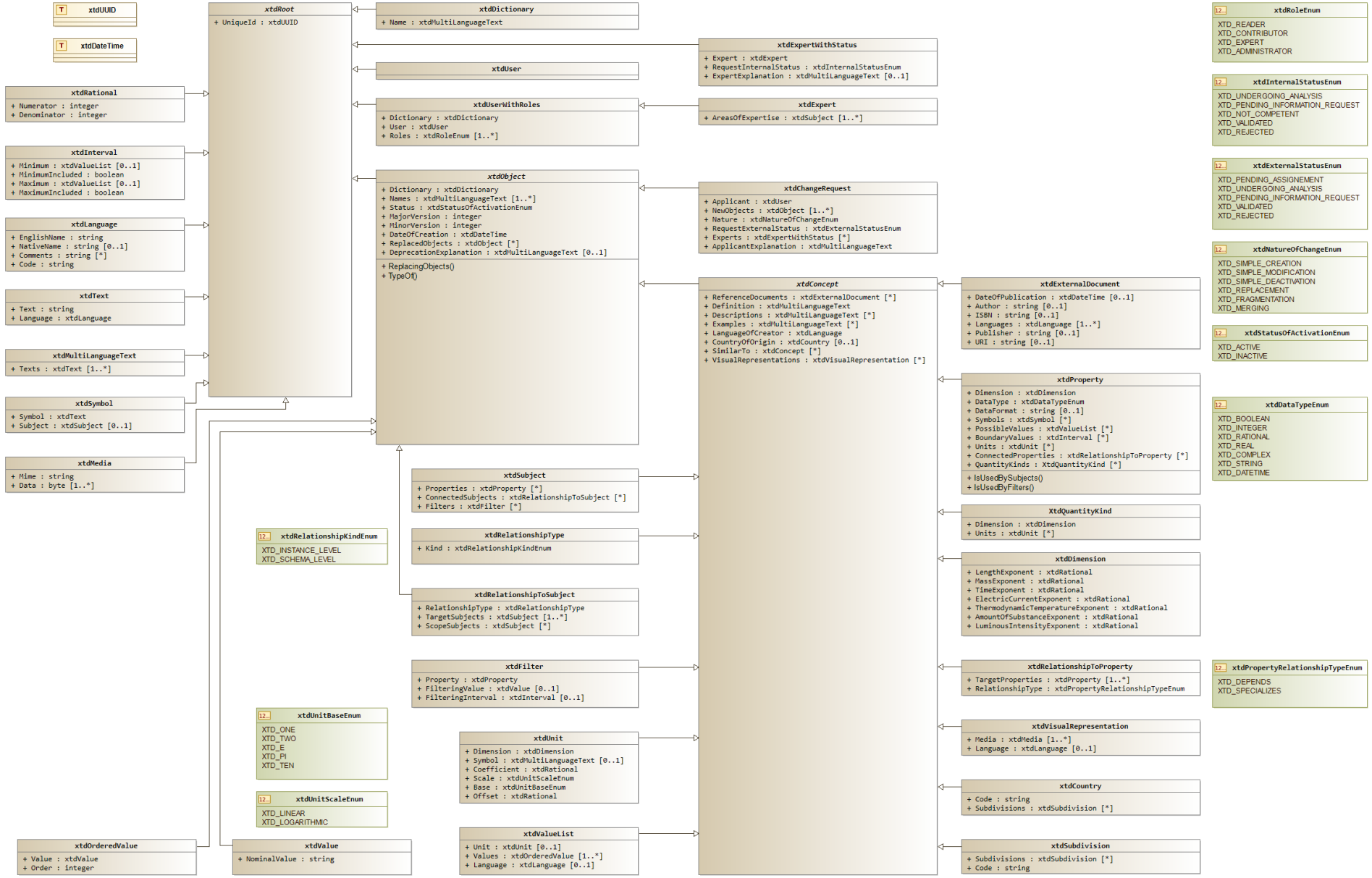
EN ISO 12006-3



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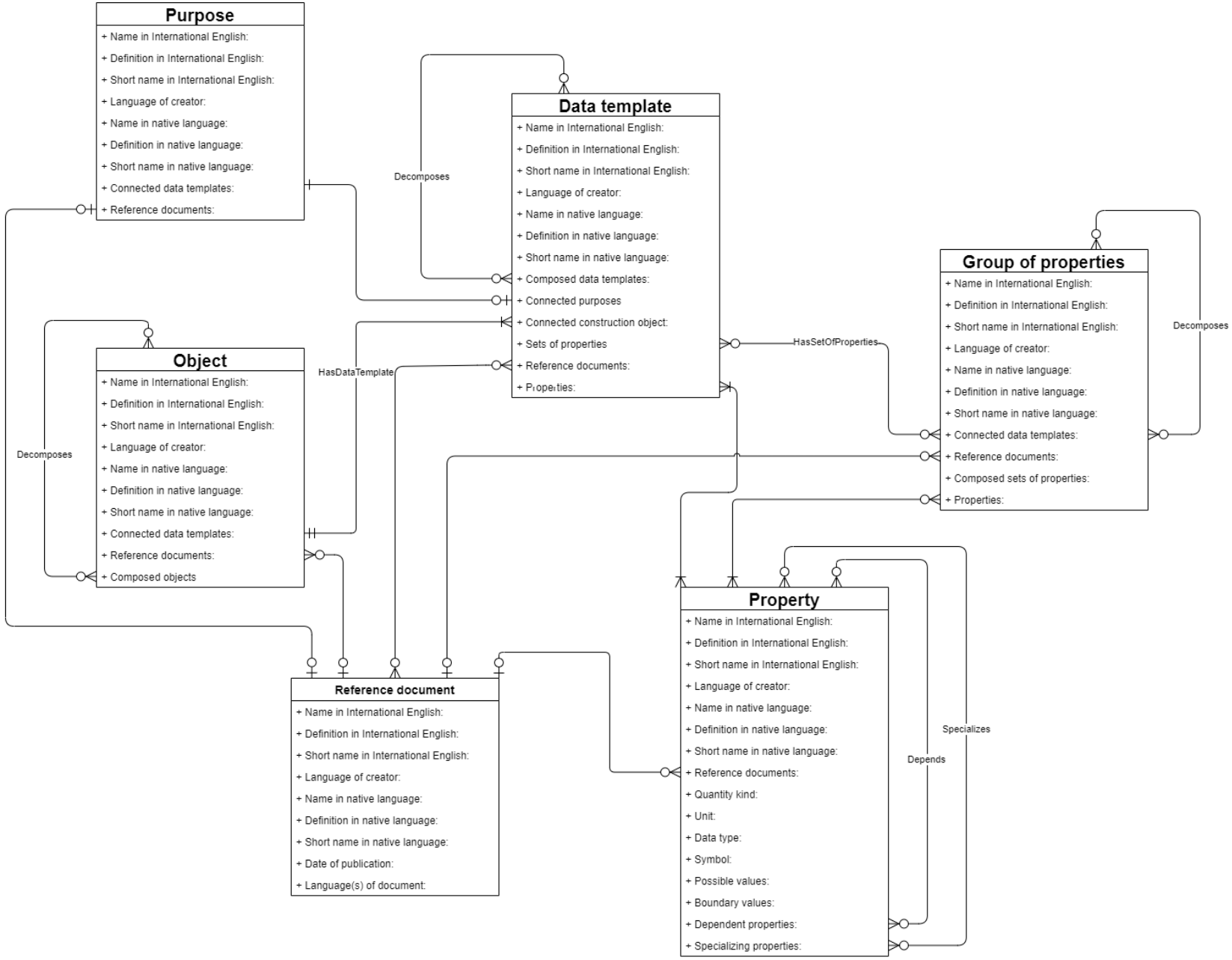
EN ISO 23387



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Transition pathway for Construction
DIGITAL TRANSFORMATION

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EN ISO 23386

EN ISO 23387

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EN ISO 23386

EN ISO 23387

EN ISO 22057

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Environmental indicators for BIM

TC 442

TC 59

EN ISO 23386

EN ISO 23387

EN ISO 22057

Made by sustainability experts in CEN and ISO

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ISO 22057 – environmental indicators published on ISO website

Sub-scenario:	Name	Description	GUID	Unit	Enumerated values	Dependency 1
	alternative name	Different name by which the owner of the declaration is also known.	3C99aw4Ur53eirrz$W$uw4	unitless		
	content of regulated hazardous substances	declaration of material content of regulated hazardous substances of the finished product	0w$1F7Vk17L8tW8yV$3Vu3	unitless		
	content of substances of very high concern	content of substances with hazardous and toxic properties that can be of concern for human health and/or the environment. In Europe these are substances listed in the Candidate List of Substances of Very High Concern for Authorisation of the European Chemicals Agency.	2uep_8KlHFZPgvETqtiHFG	unitless		
	data set valid until	end date of the time period for which the data set is still valid. This date also determines when a data set revision / remodeling is required or recommended due to expected relevant changes in environmentally or technically relevant inventory values, including in the background system	0pb8bLdMf3SB$4iV$cRvsl	unitless		
	EPD programme operator	name of the program operator that publishes the EPD	04JOWJlvj49ebQ1ftBh3$_	unitless		
	EPD registration number	ID number of an EPD , it can be published in different EPD-programmes with different ID numbers	2txQS3gq114gZSFxVagfsC	unitless		
	link to the other machine-readable datasets	TBD	0y45AJkn9BhwFwFVThTDGT	unitless		
	main product components or materials - type	a description of the main product components or material that make up the construction product or work	1WhfJiAl51kfx6zvSBVYib	unitless		main product components or materials - percentage by mass
	main product components or materials - percentage by mass	amount of main product components or materials	2k8EOX_FH5Sxg4HBQ8S8a2	percent		
	manufacturer(s) providing data	TBD	3czIR_qJnESvwrCvT6VxON	unitless		
	name of owner	the manufacturer, or group of manufacturers, of the construction product that own the dataset	02xb3mjHD7VPQu6muPWLF5	unitless		
	name of verifier	name of the person that carries out verification	1VuTNpq795DfPt7dqfztsB	unitless		
	name of verifier's organisation	The name of the organization to which the verifier is affiliated	3GsHjd29n0RANH_H9Y6vct	unitless		
	organisations authorised by the EPD owner(s) to use the EPD data	organisations authorised by the EPD owner(s) to use the EPD data to represent their products	0VQsomMUL3JA5qAo_baCAW	unitless		
	organisations related	TBD	1UeQ3Cb3T7lhOnxmePiLnQ	unitless		
	packaging type	type of packaging used	0$D7nYrTX5pxN$3kkaHlLq	unitless		packaging amount
	packaging amount	amount of packaging used	1buRiET$DDDgZHn8ytNxh7	kilogram		

CEN technical committees for design and product standards

TC 442

EN ISO 23386

EN ISO 23387

WI 00442051

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WI
00442051

Tables

Data template (International English)							
Name	Definition	Short name	Reference document	Composed data templates	Connected object	Properties	Sets o. properties

Object (International English)					
Name	Definition	Short name	Reference document	Connected data templates	Composed objects

Property (International English)											
Name	Definition	Short name	Reference document	Quantity kind	Unit	Data type	Symbol	Possible values	Boundary values	Dependent p ope ti s	Specializing properties

Set of properties (International English)						
Name	Definition	Short name	Reference document	Connected data templates	Composed sets of properties	Properties

Reference document (International English)			
Name	Definition	Short name	Date of publication

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CPD ER No.	Essential characteristics	Mandate			Requirement clauses in this European Standard	Levels and/or classes	Notes
		M/101		M/122			
		Windows	Doors	Roof windows			
2	External fire performance	N	N	Y	4.4.2	B_{ROOF} (t1) - F_{ROOF} (t1), B_{ROOF} (t2) - F_{ROOF} (t2), B_{ROOF} (t3) - C_{ROOF} (t3) - D_{ROOF} (t3) - F_{ROOF} (t3), B_{ROOF} (t4) - C_{ROOF} (t4) - D_{ROOF} (t4) - E_{ROOF} (t4) - F_{ROOF} (t4)	
	Reaction to fire	N	N	Y	4.4.1	A1, A2, B, C, D, E, F	
	Resistance to fire (E + EI)	Y	Y	Y			
	Smoke leakage (S)	Y	Y	N			
	Self-closing (C)	N	Y (self-closing fire doors only)	N			
3	Watertightness [a]	Y	Y	Y	4.5 and 4.15		Technical classes of convenience
	Dangerous substances	Y (indoor impact only)[c]	Y (indoor impact only)[c]	N	4.6		
4	Resistance to wind load	Y	Y	Y	4.2		Technical classes of convenience
	Resistance to snow and permanent load	N	N	Y	4.3		[kN/m^2]
	Impact resistance	[N]	Y (glazed doors with injury risk only)	Y	4.7 and 4.24.1		Technical classes of convenience
	Load-bearing capacity of safety devices	Y[b]	Y[b]	Y[b]	4.8		Threshold
	Height	N	Y	N	4.9		[mm]
	Ability to release [a]	N	Y (locked doors in escape routes only)[d]	N	4.10 and 4.15		Technical classes of convenience

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CPR No	Essential characteristics	Mandate			Requirement clauses in this European Standard	Levels and/or classes	Notes
		M/101		M/122			
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	Resistance to fire (E + EI)	Y	Y	Y			
	Smoke leakage (S)	Y	Y	N			
	Self-closing (C)	N	Y (self-closing fire doors only)	N			
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	Dangerous substances	Y (indoor impact only)[c]	Y (indoor impact only)[c]	N	4.6		
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	Reaction to fire	N	N	Y	4.4.1	A1, A2, B, C, D, E, F	
	Resistance to fire (E + EI)	Y	Y	Y			
	Smoke leakage (S)	Y	Y	N			
	Self-closing (C)	N	Y (self-closing fire doors only)	N			
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	Dangerous substances	Y (indoor impact only)[c]	Y (indoor impact only)[c]	N	4.6		
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	Resistance to snow and permanent load	N	N	Y	4.3		[kN/m^2]
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	Load-bearing capacity of safety devices	Y[b]	Y[b]	Y[b]	4.8		Threshold
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	Ability to release [a]	N	Y (locked doors in escape routes only)[d]	N	4.10 and 4.15		Technical classes of convenience

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	Reaction to fire	N	N	Y	4.4.1	A1, A2, B, C, D, E, F	
	Resistance to fire (E + EI)	Y	Y	Y			
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	Self-closing (C)	N	Y (self-closing fire doors only)	N			
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European data dictionary

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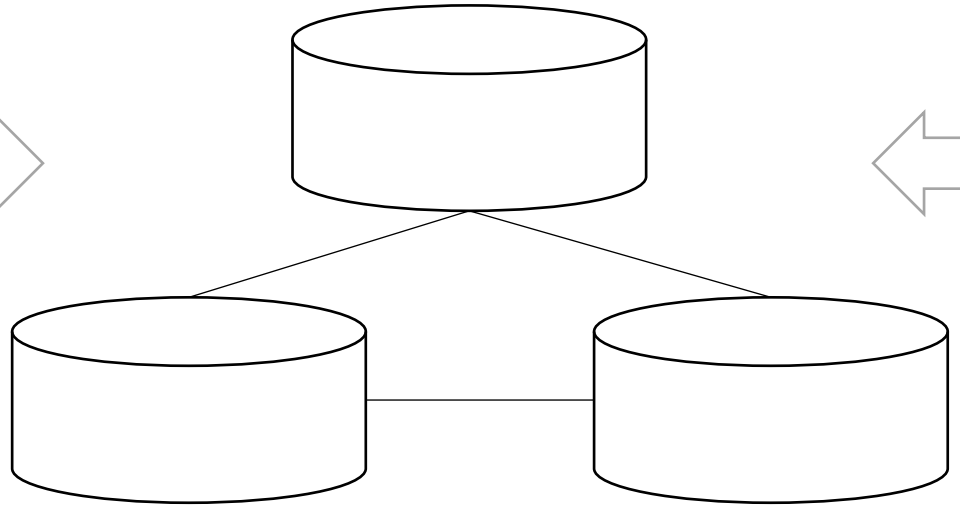
European data dictionaries



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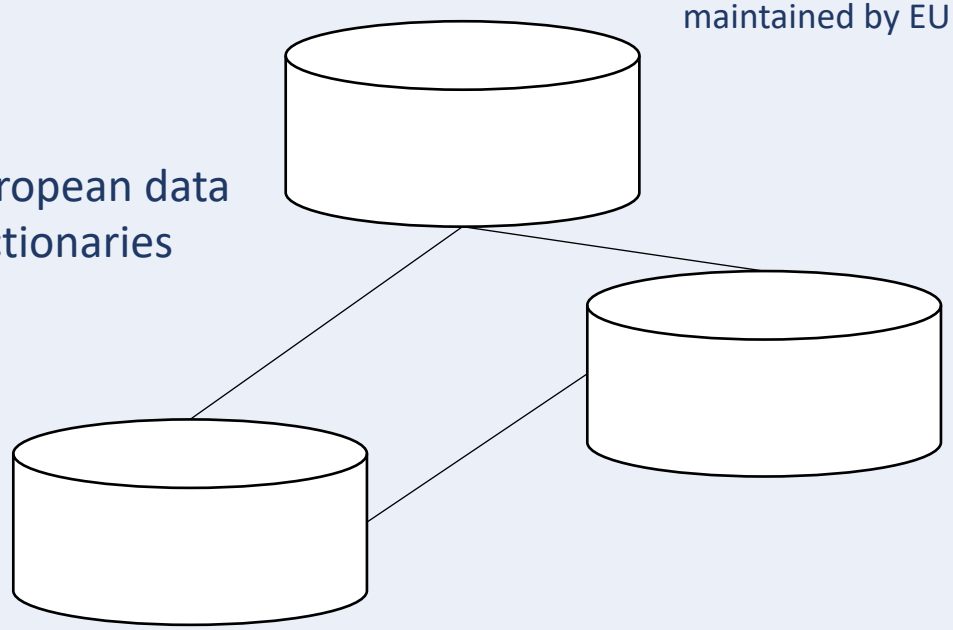
- Governance of data
- Trustworthy content
- Created and maintained by EU

European data dictionaries



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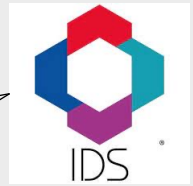
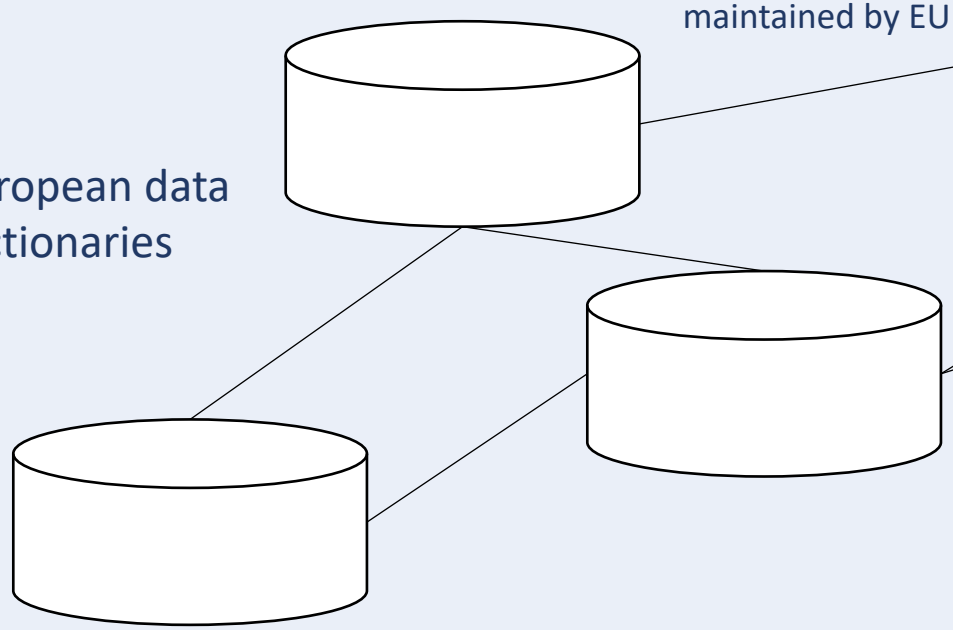
- Governance of data
- Trustworthy content
- Created and maintained by EU

- Display governed data
- Use of trustworthy content



European data dictionaries



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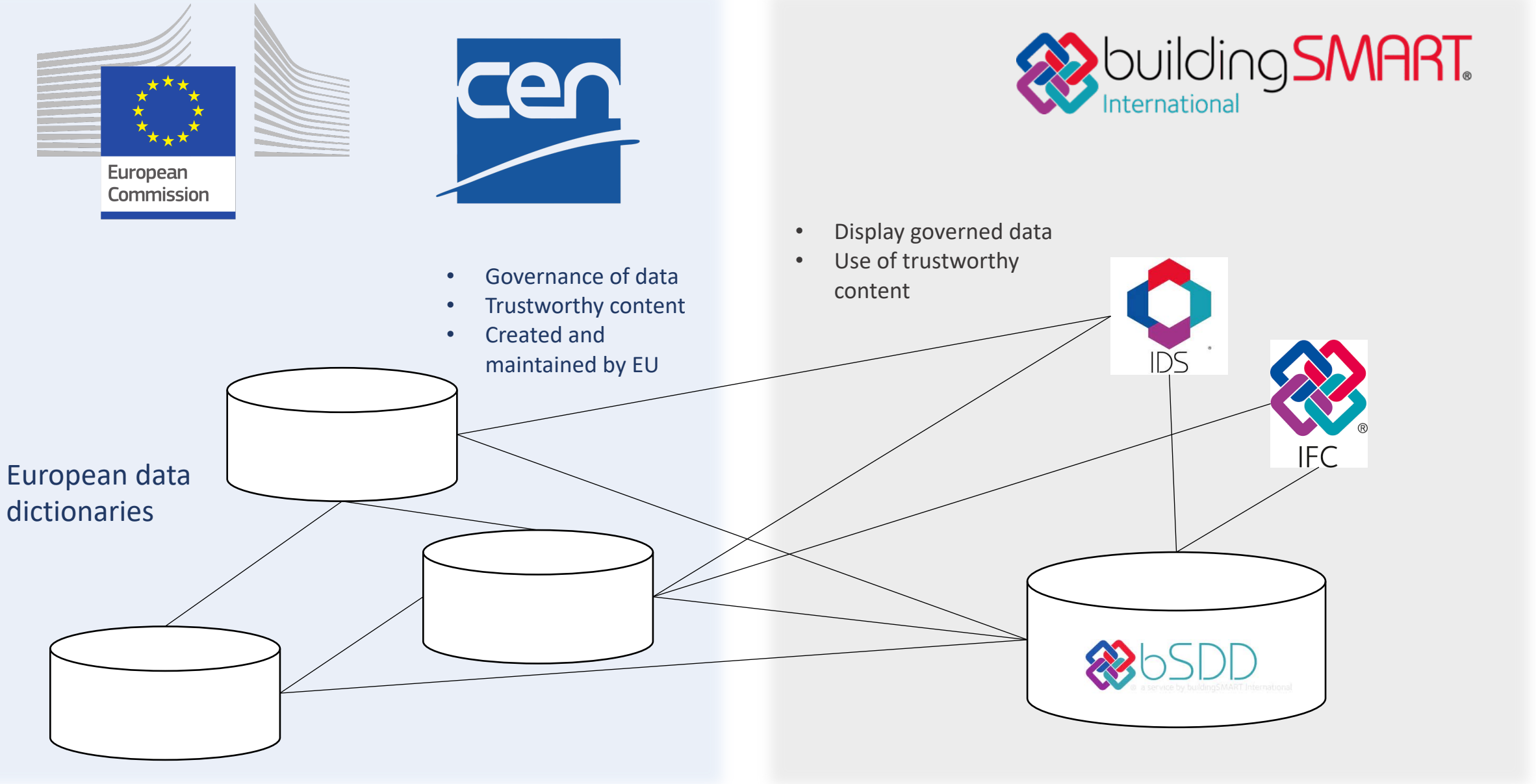
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Governance of data
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Use of trustworthy content
IDS
IFC
European data dictionaries
bSDD

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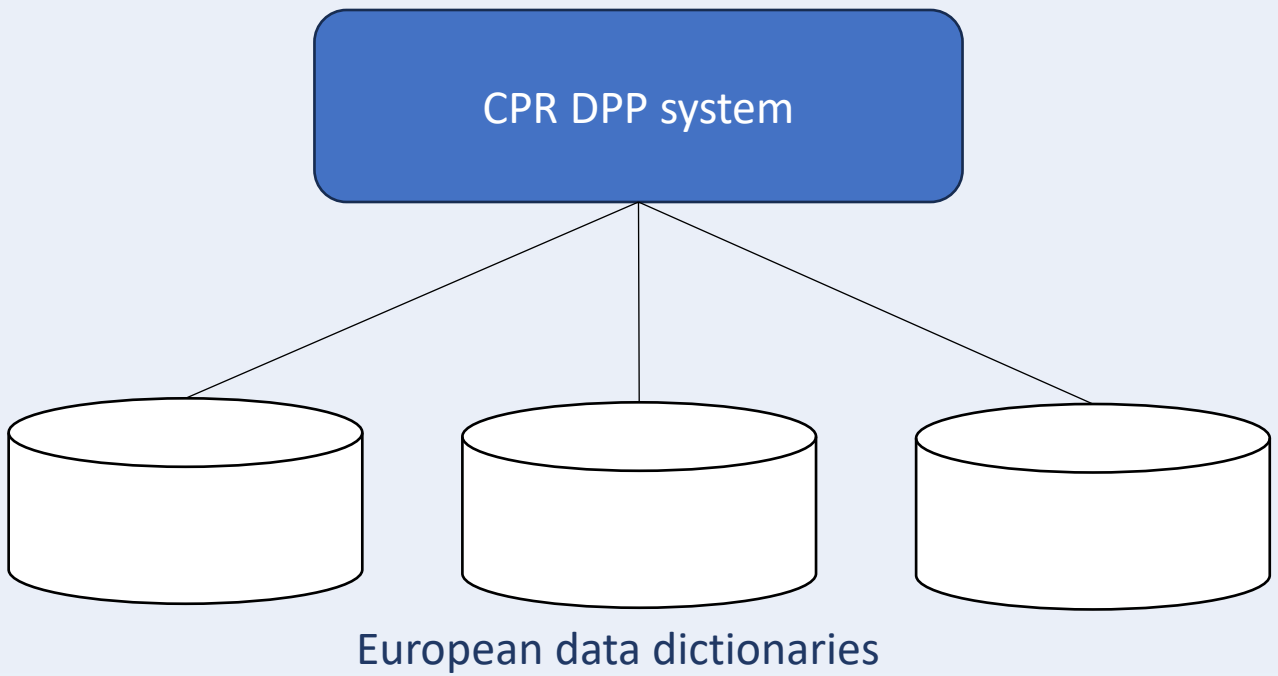

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Call for tenders GROW/2023/OP/0004 – Feasibility study on an EU database for construction products

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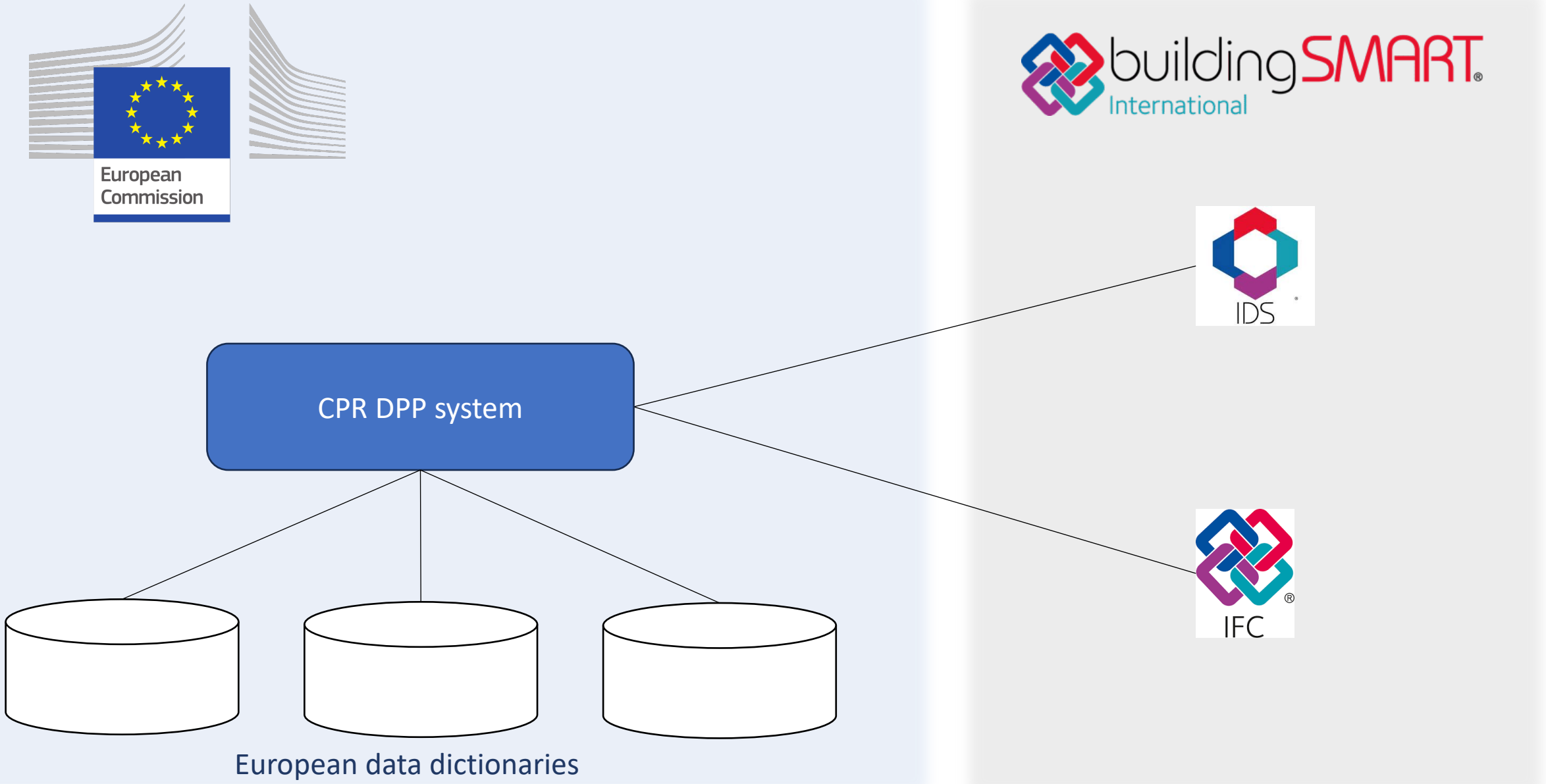
European Commission
buildingSMART International
IDS
CPR DPP system
IFC
European data dictionaries

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European Commission

CPR
Article 81
Construction digital product passport system

…. without compromising interoperability with Building Information Modelling (BIM)….

buildingSMART International

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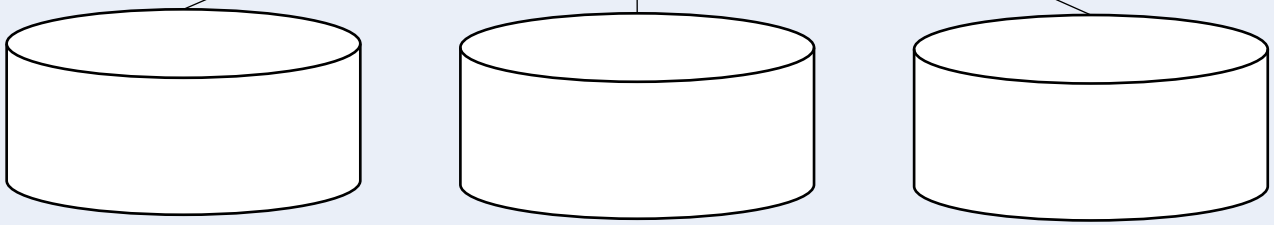
CPR DPP system



European data dictionaries

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Thank you!

Contact me for further
information and discussions

schulze@cobuilder.no

/espen-schulze

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