

## Zpráva za rok 2023

### TC442/WG6

Skupina se se června roku 2022 nesešla. Po ukončení práce na „CEN/TR 17920“ nebylo svoláno jednání skupiny.

- 7.6.2023 byla oznámena resignace na funkci „convenora“ pana Thomase Jenssena a byl vyhlášena výzva zájemcům o tuto funkci. K 30.6.2023 byli čtyři kandidáti:  
Mr Jiri Bunes, nominated by UNMZ (Czech Republic)  
Mr. Marius Fidje Hope, nominated by SN (Norway)  
Mr Miika Kostamo, nominated by SFS (Finland)  
Mr. Dominique Chevillard, nominated by AFNOR (France)

Volba byla provedena a byl vybrán Mr. Dominique Chevillard z AFNOR.

Od nového roku, co byla oznámena rezignace pana Jenssena byla ve skupině minimální aktivita. Po zvolení nového convenora bylo první jednání 15.11.2023 kde se diskutovala témata navrhovaná pro WG6 viz níže.

V příloze Business plan TC 442 předloženy WG6.

Proposer	Scope	Deliverable
Stefan	<p>Guide for using existing standards for infrastructure.</p> <p>This document outlines the practical use of BIM standards in infrastructure projects, focusing on their importance, real-world applications, and integration strategies for professionals seeking efficiency and collaboration enhancements.</p>	Guide/TR
Dominique	<p>Long-term storing and maintenance of infrastructure data.</p> <p>This document establishes guidelines and requirements for the long-term storage and maintenance of critical infrastructure data. It outlines best practices and compliance measures to ensure the durability and accessibility of infrastructure data over extended periods. This document is intended for adoption by organizations responsible for infrastructure data management to promote consistency, reliability, and interoperability across European infrastructure projects.</p>	EN
Marius	<p>Level of information need in infrastructure.</p> <p>This document sets forth requirements and criteria for determining the appropriate level of information needed (LIN) at various stages of infrastructure projects. It outlines best practices and requirements to ensure that project stakeholders have access to the right amount of information at the right time.</p>	EN
Miika	<p>Holistic approach to use LandXML</p> <p>This document establishes comprehensive requirements and best practices for adopting a holistic approach to the utilization of LandXML in various phases of land development and infrastructure projects. It defines standardized processes, data structures, and interoperability requirements to ensure seamless integration and data exchange across European projects.</p>	EN?
Jiri	<p>Data dictionary for infrastructure</p> <p>This document establishes requirements and specifications for the creation and utilization of a comprehensive data dictionary tailored for infrastructure projects. This document is designed to promote a unified approach to data organization, making it a valuable resource for infrastructure professionals, stakeholders, and organizations to improve data quality, streamline processes, and facilitate effective decision-making in the European infrastructure sector.</p>	EN
Jiri	<p>Classification of infrastructure in Europe</p> <p>This document provides guidelines for classifying infrastructure assets and systems in Europe, following the principles outlined in the IEC/ISO 81346-series. It establishes a standardized framework for categorization, ensuring consistency, clarity, and international compatibility in the European infrastructure sector. This document aims to enhance asset management, data exchange, and decision-making across European infrastructure projects while aligning with global standards.</p>	EN

**Jednání za rok 2023:**

Celkem 3 neoficiální jednání.

Jednání 15.11.2023 první oficiální zasedání po publikování CEN/TR 17920

Jednání 14.12.2023 práce na tématech – rozpracována prezentace v MS PowerPoint Business plán

Plánovaná jednání

26. ledna 2024

28. února 2024

Je plánováno zasedání TC 442 v Praze v Březnu 5.-7. WG6 nebude mít zasedání “face to face”, protože se teprve hledají témata, kterými se bude WG 6 dále zabývat.

Ing. Stanislav Bedřich

**CEN/TC 442 "Building Information Modelling (BIM)"**Secretariat: **SN**Secretary: **Landfald Lisbet Mrs****TC 442 Business Plan update - for TC approval**

<b>Document type</b>	<b>Related content</b>	<b>Document date</b>	<b>Expected action</b>
Ballot / Reference document	Ballot: <a href="#">Updated Business Plan for approval</a> (restricted access)	2023-01-18	<b>VOTE</b> by 2023-03-01

**Description**

Dear all,

Referring to document N 862 "2022-11-04 BP update ready for TC approval" and the Plenary meeting in Helsinki last November. WG 10 proposed that the draft revision of the 2022 Business Plan (N 862) be circulated to CEN/TC 442 as a Committee Internal Ballot (CIB) for approval. This was agreed. See Draft Minutes N 879.

A CIB is set up for the approval of the updated Business Plan. Please submit your vote **by 2023-03-01**.

If the Business Plan is approved, any comments received at this stage will be saved for later updates. TC 442 has agreed to update the Business Plan every 2nd year.

**CEN/TC 442 "Building Information Modelling (BIM)"**Secretariat: **SN**Secretary: **Landfald Lisbet Mrs****221104 BP update ready TC approval**

<b>Document type</b>	<b>Related content</b>	<b>Document date</b>	<b>Expected action</b>
Meeting / Document for discussion	Meeting: <a href="#">Helsinki (Finland) 10 Nov 2022</a>	2022-11-07	<b>INFO</b>

**Replaces:** N 860 TC 442 Business Plan update November 2022 for TC approval

**Description**

Dear all

Please see the **rev01** draft updated Business Plan for CEN/TC 442. This document replaces N 860. There are some small changes to the draft updated BP in document N 860.

At the recent meeting of WG 10, held on 2022-10-31, the WG concluded its work on the draft revision of the 2022 Business Plan. WG 10 proposes that a Committee Internal Ballot (CIB) be launched for the approval of the draft revision of the 2022 Business Plan. This will be discussed at the plenary meeting 10. November.

**Business Plan**  
**CEN/TC 442 Building Information Modelling (BIM)**  
2022 update

**SCOPE CEN/TC 442**  
**Building Information Modelling**

Standardization in the field of structured semantic life-cycle information for the built environment. The committee will develop a structured set of standards, specifications and reports which specify methodologies to define, describe, exchange, monitor, record and securely handle asset data, semantics and processes with links to geospatial and other external data.

**EXECUTIVE SUMMARY**

**Business Environment**

Building Information Modelling (BIM) is about information modelling and management in the construction industry. BIM can be used in all sectors of construction (e.g. railway or waterways etc.) and related usage (e.g.: simulation, augmented reality, or digital twins etc.) in order to achieve meaningful, open and structured data that can be used within or across projects and asset management activities in different countries and throughout the asset life cycle.

CEN/TC 442 standards and specification can support implementation of high-level strategies such as EU Twin strategy: Green Growth and digitalization in the construction ecosystem.<sup>1</sup>

The construction industry ecosystem is the second most important of the 14 identified ecosystems. It constitutes 9,6% of European GDP and represents 24,9 million jobs and 5.3 million enterprises. The construction industry is dominated by micro and small enterprises. 99.9% of the companies of the ecosystem are SMEs, which represent 90% of employment and 83% of the total value added. It uses about 50% of the raw materials taken from the earth, generates about 40% of all greenhouse gas emissions in Europe and generates a waste stream that has 13% of the European total<sup>2</sup>.

The industry is seen as being relatively inefficient in both process and service delivery. Traditional practices lead to duplication of activities as well as increases in costs, timescales, and waste for the delivery of construction projects and the operation of assets.

Building Information Modelling (BIM) is seen as being as a part of the solution to the management of the information during the design, construction, and operational phases of the asset lifecycle. The development of BIM is advancing rapidly and requires the application of common standards to ensure future compatibility of information exchange and use.

---

<sup>1</sup> New green deal (green growth strategy) and the connected strategies identify the construction industry (or ecosystem) as one of the key sectors to achieve the goal defined in the strategy. Digitalization is identified as an enabler to drive the desired changes in the industry.

<sup>2</sup> swd-annual single marked report 2021 (europe.eu)

CEN/TC442 liaises closely with ISO and other relevant international standardization bodies e.g. IEC, buildingSMART, OGC etc.

CEN/BT has asked CEN/TC442 to coordinate the digitalization across CEN TC's and with CENELEC, ISO and IEC<sup>3</sup>. CEN/TC442 will deliver guidelines on how CEN TC's can digitalize their standards and property definitions in a way that supports the use of BIM in the European (and international) construction ecosystem.

The ultimate benefits of widespread adoption of BIM are likely to include greater efficiency, predictability, efficient use of materials, reduced operational impacts and better buildability and quality.

### **Benefits**

The introduction of common standards and operating methods and information management using BIM will:

- Harmonize a European wide common strategic approach for the introduction of BIM in a highly fragmented construction sector while actively including small and medium sized enterprises.
- Enable the wide-spread and secure adoption of digitalized processes on mainstream construction projects with a skilled workforce equipped with the digital competences and capacity to operate across the value chain and across projects of differing size, complexity and type.
- Help and facilitate the adaptation to a sustainable built environment – one that supports the challenges of climate change and the need for a circular economy by improving resource efficiency of construction products and materials.
- Greater productivity of the sector – delivering more facilities for the same or less expenditure.
- Improve output quality of public and private assets and improve the value for money of public and private sector investment and service delivery in operation.
- Support improvements in team working and collaboration; leading to a stronger and digitally-skilled sector attracting talent and investment.
- Help other standardization Committees to create their standards according to the outcome of CEN/TC 442.

### **Priorities**

- Ensure that the pace of transformation allows the sector and all members of the value chain to adapt to the changes and to grow capacity.
- Facilitate the adoption of a security-minded approach that supports use of digital technologies and greater collaboration while continuing to protect and manage sensitive information.
- Understand existing activities and standards in use within the European market.
- Adopt suitable standards and technical specifications from ISO and then extend to cover new areas including infrastructure as well as records management.
- Develop new standards to support process management and associated guidance, such as standards that enable the use of European sustainability standards in BIM.
- Develop relationships with key stakeholders including the European Commission

More information regarding BIM definitions is found in Annex A1.

---

<sup>3</sup> Ref.: BT decision 047/2019 and CEN/TC442 N502

## 1 BUSINESS ENVIRONMENT OF THE CEN/TC

### 1.1 Market needs

The European construction sector is at the center of a tough but also promising set of economic, environmental, and societal challenges. 92% of enterprises have less than 10 employees and limited resources. Through addressing their needs, the use of standards may be significantly increased. Furthermore, if standards are tailored to meet the needs of small business entities, considerable benefits would accrue to all stakeholders in standardization.

Climate change, resource efficiency, greater demands on social care, urbanization and immigration, an aging infrastructure, the need to stimulate economic growth, as well as constrained budgets; these are challenges faced by governments, public infrastructure owners and society as a whole. An innovative, competitive and growing construction sector is a crucial component for tackling these challenges.

Digitalization is the adoption, or increase in the use, of digital technology by an entity such as an organization, industry sector or country.

The introduction of Building Information Modelling (BIM) represents the construction sector's progress towards digitalization. It is undisputed that the wider use of technology, digital processes, automation, and higher-skilled workers contribute greatly to our economic, social and environmental future.

Current practices and studies show how traditional processes repeatedly experience dramatic information loss, especially in the steps between design, construction, and operational stages. Processes that are merely digitized are often supported by additional manual processes to build and rebuild information. Therefore:

- Construction cost is increased by splitting up of processes and lack of communication.
- Without a common digital terminology, there are often significant communication errors and loss of information.
- The same information is often re-entered several times in different systems before the building is handed over to owner organization.
- Same information is also re-created several times by different software packages and even then, it rarely reaches the end user of the asset or operator!

Building Information Modelling (BIM) is a way of structuring information about infrastructure and buildings. BIM refers to the use of a shared digital representation of a built asset to facilitate the construction process (including buildings, bridges, roads, process plants etc.) to facilitate design, construction, and operation processes to form a reliable basis for decisions.

The resulting information model can be visualized as a virtual representation of the real asset and can report object properties and relations. BIM gives a better understanding of complex building information and supports many digital tools for effective information handling.

Good information management is a precondition to tackle lean design and construction, digital access to maintenance of projects as well as product information during facility management or operation.

The possible benefits outlined above will only be achieved through the wide-spread adoption of digitalization on all construction projects. Therefore, adoption needs to be at scale, with a skilled workforce equipped with the digital competences and capacity to operate across the value chain, and across projects of differing size, complexity, and type.



This capacity building is only possible through a consistent way of working that removes or reduces the transaction cost of re-learning from one project to the next.

With a digitalized construction process, loss of information between processes and/or stages can be eliminated or at least strongly reduced. This requires the development and implementation of an open and interoperable BIM-model, supported by standards used in digital platforms across the European construction industry.

Digitalization of the construction sector also requires the ability to exchange information about products that are incorporated into buildings and infrastructure assets, including the materials from which they are constructed as well as the more complex products and systems which are incorporated into buildings and assets to make them safe, comfortable, and fit for purpose.

In Europe, construction products declare the performance according to harmonized specifications or standards mandated by the Commission, according to the Construction Products Regulation. Manufacturers, when covered by harmonized specifications or standards, must declare the performance according to the rules included in the standard or specification. TC 442 will use the performance indicators included in these standards to promote the single market and to ensure a common declaration of the information of construction products.

## 2 BENEFITS EXPECTED FROM THE WORK OF THE CEN/TC

The overall benefits of the work from CEN/TC 442 are through BIM to support the visions for sustainable growth based on better resource efficiency through data sharing in the construction industry in Europe.

CEN/TC442 will specify methodologies to digitally define, describe, exchange, monitor, record and securely handle asset data, semantics, and processes with links to geospatial and other external data which other TCs will then adopt. However, the **other TCs will define their own properties, processes, and elements.**

CEN/TC 442 delivers standards and guidance to support and enable digital transformation for construction.

The benefits and opportunities of adopting BIM will enable progress to:

- Deliver the digitization of construction in Europe in a secure way.
- Increase the competitiveness and efficiency of operation of buildings and infrastructure assets throughout their life cycle.
- Increase the competitiveness of the European Construction sector (e.g. engineering firms, contractors, designers and product manufacturers) in their world-wide activities.
- Deliver efficiencies for client organizations regarding requirements of legacy systems.
- Facilitate secure information exchange between client's asset management systems and contractors/designers' systems through increased interoperability.
- Deliver efficiencies for contractors and manufacturers through standardized product selection and ordering processes.
- Increase certainty for construction clients to achieve their asset objectives and improvements in briefing because of improvements in post occupation evaluations.
- Provide a common understanding regarding the design of built environment between owners, operators and users, designers, contractors, and manufacturers of construction products.
- Facilitate secure exchange of information about construction services between stakeholders.
- Facilitate the marketing and use of construction products and offsite assemblies.
- Provide a common basis for research and development in the construction sector.
- Allow the preparation of common design aids and software packages.

- Support implementation of high-level strategies for public policy.

### 3 PARTICIPATIONS IN THE CEN/TC

All the CEN National Standards Bodies are entitled to nominate delegates to CEN Technical Committees (TCs) and experts to Working Groups, ensuring a balance of all interested parties. Participation as observers of recognized European or international organizations is also possible under certain conditions (see CEN/CENELEC Internal regulation part 2 chapter 4). To participate in the activities of this CEN/TC, please contact the National Standards Body in your country.

## 4 OBJECTIVES OF THE CEN/TC AND STRATEGIES

### 4.1 Defined objectives of the CEN/TC

The aim is to help the construction sector to be more efficient and sustainable by enabling smooth information exchange and sharing between partners in the value chain.

The objectives of CEN/TC 442 are:

- To deliver a structured set of standards, specifications and reports which specify methodologies to define, describe, exchange, monitor, record and securely handle asset information, semantics and processes with links to geospatial and other related built environment data.
- Support digitalization of the construction ecosystem in Europe and inform public policies.
- To be the home for European BIM standardization.
- To support BIM coordination across relevant CEN/TCs.
- To consider New Work Item proposals to be developed in accordance with the Vienna agreement.

These objectives should support the work carried out by either other TCs or organizations dealing with standardization of products and systems, or TCs dealing with specific construction topics (e.g. acoustics, environment, Eurocodes etc.).

These objectives aim at providing methods and tools for considering and integrating the BIM needs related to their own domain. Therefore, CEN/TC 442 has to set up the conditions and methods for collaborating with the ad-hoc TCs and technical organizations. Conversely, each TC in charge of either standardization of product and system or dealing with specific construction topics would take over and integrate these tools and methods to identify and directly provide the needed BIM elements related to its activity domain; Such a TC will be called "liaison TC".

The benefits of a harmonized European approach can be summarized as follows:

Benefit of a harmonized European approach supported by standards and specifications	Description of the benefit
Accelerate national efforts	Through collaborative working and sharing of best practice, nations can accelerate their own BIM initiatives by learning from others.
Minimize costs	Wasted effort and investment can be minimized through the reuse of existing developments and knowledge.
Impactful and robust	By drawing upon existing knowledge and practical experience of

programmes	what makes programmes successful, individual nations can be informed to create and implement effective initiatives.
International critical mass	Taking a similar approach to neighboring countries for the encouragement of BIM will increase the strength and effectiveness of each individual national programme.
Reducing trade barriers to growth	Alignment of a European approach will encourage trade and opportunity for growth across borders. Creating national specific approaches will likely confuse the construction sector, discourage cross border working and add a cost burden to the industry when complying with national different approaches.
Encourage international development of standards	Europe has the opportunity to collectively encourage the development of standards for use in international markets. This ensures open competition in the supply chain and the open sharing of information across software platforms.
Facilitate digital transformation	The transformation towards a digital society could be better achieved, rapidly and seamlessly, with standards that were elaborated in CEN/TC 442.
Common understanding	Due to connected databases a unified language could be achieved so that setting up projects could be much easier. Furthermore, the interpretation of terminology will be easier for humans and computers, so that artificial intelligence could be used, and Smart Standards could be created.

Consequently CEN/TC 442 should continue to:

- Undertake strong collaboration with other TC's and technical organizations, which implies actions:
  - to organize exchanges and liaisons;
  - to define an exchange convention (when, what, how...);
  - to complete the list of Liaisons;
  - to capitalize on expertise and centralize the results;
  - to provide deliverables (e.g. guidelines, good practices...).
- Define a methodology for identifying the characteristics that will lead to the definition of properties for use within information modelling within the construction ecosystem.
- Define a methodology for including the BIM aspects into the European standards developed by the liaison TCs.
- Propose the nomination in each Liaison TC of a BIM-champion who will ensure the take-up of the proposed methodologies.
- Understand the needs of stakeholders.

## 4.2 Identified strategies to achieve the CEN/TC's defined objectives.

### 4.2.1 Introduction

Interoperability <sup>4</sup>can be achieved without standardization but it conditions the project to agree on its own rules and deliveries. A high level of expertise and resources is required, and utilization of information in the construction life-cycle is not ensured.

Efficient interoperability requires a set of standards and implementation, that include:

- A standardized way to store and exchange data models and implement them in software packages securely where necessary.

<sup>4</sup> [New European Interoperability Framework, particularly figure 3, page 22.](#)

- A common understanding of terminology and data-semantic structure.
- An agreed set of information delivery specifications to support the needs of the information recipient.

Efficient object-based interoperability is supported by three sets of standards:

- Process standards to specify how to describe and manage the required information supporting a given process.
- Data Model standards to specify data structure for entities, geometry, and related properties as well as classification for exchanging data models. The data model ensures exchange of object-based information.
- Data Dictionary standards to specify data structure for defining data-semantic concepts (entity, property, classification...) and relations between them.

#### 4.2.2 Understanding the current position

It is not possible to move directly from a traditional modelling approach towards an open BIM approach. The change must be managed progressively.

To evaluate which level is reached, indicators have been introduced. These indicators measure four aspects: the content, the digitalization, the interoperability, and the collaboration.

The figure below illustrates the evolution and intended development of digitalization of the construction ecosystem.

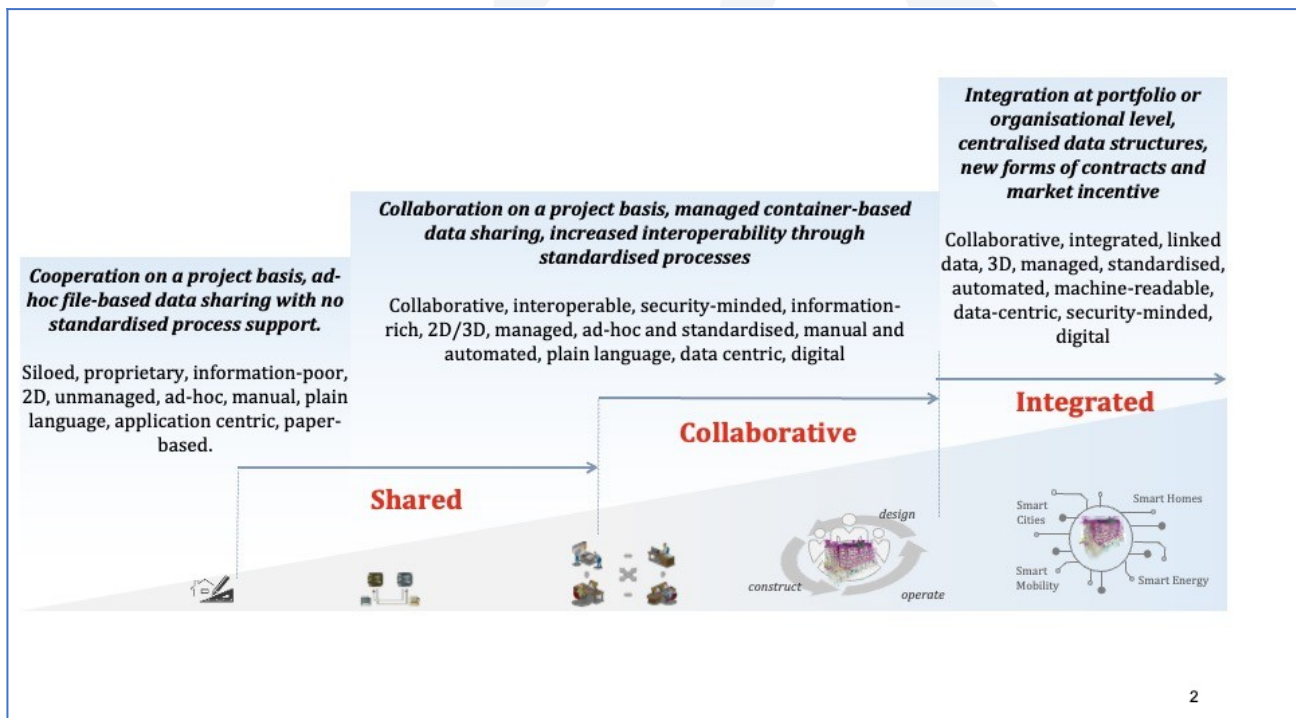


Figure 1 Developing an integrated digital construction ecosystem

Currently the use of BIM is heavily dependent on national methodologies, and it is applied to isolated projects individually. As and when stakeholders become fully conversant with the underlying principles, they will be able to converge towards integrated models and databases. To this end, CEN/TC 442 is standardizing the process for information modelling, exchange, and management. Further help will be given by guidance to implement the standards.

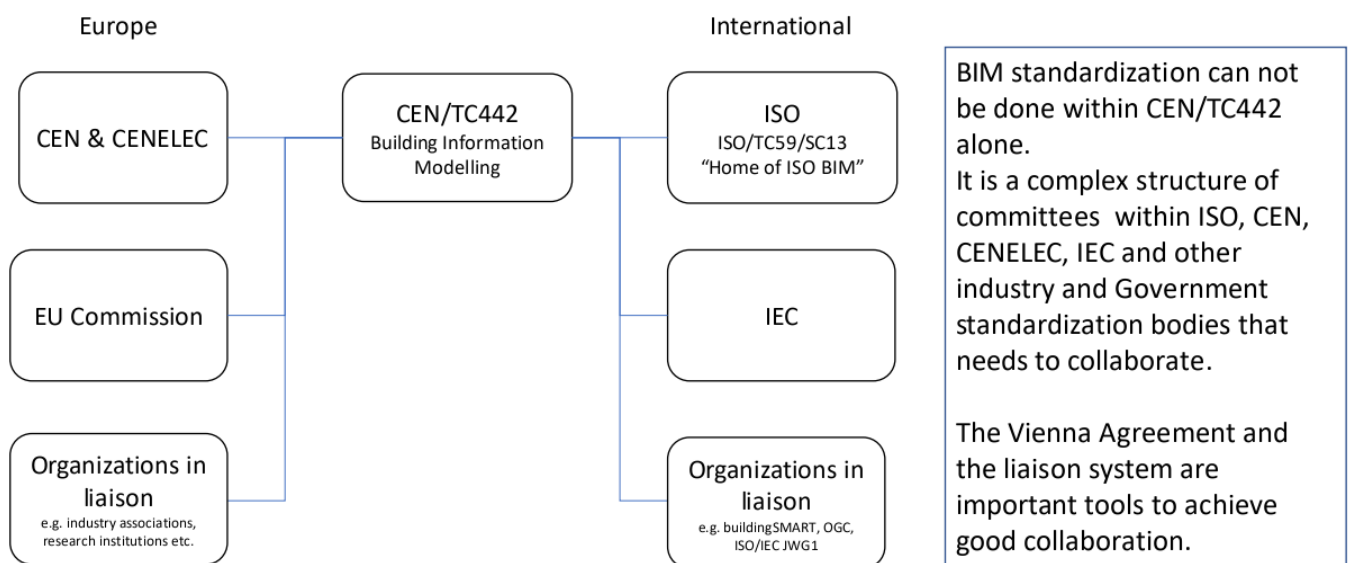
#### 4.2.3 Collaborate with ISO through Vienna Agreement

The work programme includes, according to the Vienna agreement and where appropriate, to make current ISO standards for BIM valid as EN standards or technical specifications. EN standards will be implemented as national standards within CEN Member States and thereby have a greater impact on national level than ISO standards which are not mandatory to implemented as national standards.

CEN/TC442 will propose adoption of relevant new projects by ISO and develop standards in accordance with the Vienna Agreement and request CEN lead when appropriate.

CEN/TC 442 operates in close collaboration with other CEN and ISO committees and with other industry standardization organizations.

## Relations in international BIM standardization



4

Figure 2 Example of relations in international BIM standardization

#### 4.2.4 Information exchange and modelling

CEN/TC442 will deliver data structures, exchange formats and protocols for Building Information Modelling. International standards for BIM allow information to be exchanged and shared among software applications used by the various participants.

**Actions:**

- Enhance open BIM standards.
- Extend and develop standards for industrial assets and infrastructure.
- Extend and develop data structures for electronic product catalogs for building services.
- Develop further project related data structures.
- Support Information management.
- Support record management and long-term archiving.

#### 4.2.5 Information Delivery Specifications

CEN/TC 442 will deliver standards and guidelines that describe how to capture and integrate construction processes, and business practice. The TC will provide detailed specifications regarding the information that any user fulfilling a particular role would need to provide at a particular point within an asset's life cycle.

##### Actions:

- Further develop frameworks for BIM guidelines
- Detail and develop methods for use case applications
- Support and consider practical implementation of energy assessment requirements
- Support and consider practical implementation of lifecycle cost and carbon assessment
- Support asset management and operation.
- Support digital efficiency in statutory approval with planning and regulatory authorities.

#### 4.2.6 Support Data Dictionaries

CEN/TC442 will deliver standards and guidelines that describe how to set up, create content and interconnect dictionaries.

To ensure one common digital language for the construction ecosystem in Europe, standards are not enough. Machine-readable dictionaries for properties are needed to ensure interoperability.

##### Actions:

- Harmonize the description of construction product property sets.
- Support harmonization of European classification tables.
- Extend interoperability between data dictionaries.
- Improve the organization and structure content for data dictionaries.
- Seek feedback to improve standards for data dictionaries.

#### 4.2.7 Collaboration with relevant technical committees and organizations

According to the CEN/BT decision 047/2019 CEN/TC442 will coordinate the digitalization across CEN TCs and with CENELEC, ISO and IEC. CEN/TC442 will deliver guidelines on how CEN TCs can digitalize their standards and property definitions in a way that supports the use of BIM in the European (and international) construction ecosystem.

CEN/TC 442 has established liaisons and cooperation with the following technical committees and organizations.:

[\(Link to list\)](#)

**Actions:**

- Identify key stakeholders for future collaboration.
- Encourage other TCs to establish a liaison with CEN/TC 442 in order to link their work with BIM.
- Publish guidelines to support development of machine-readable standards and property definitions from CEN TCs.
- Extend CEN/TC442 activities towards infrastructure to include infrastructure stakeholders.

**4.2.8 Digital Twins for the built environment**

A digital twin is seen as a virtual representation that serves as the real-time digital counterpart of a physical object. The development of a BIM-based Digital Twin Environment (DTE) could optimize the enabler between the planned (As-planned) and the realized object (As-built) to optimize it.

CEN/TC 442 together in liaison with other initiatives (e.g. IoT and Industry 4.0, Lean Construction, Green and Buildings, Smart Grids, ISO/IEC JTC1 etc.) will deliver standards and guidelines to structure the information for digital twins applied to the built environment, considering methodologies and formats to define, describe, exchange, monitor, record and securely handle digital twin's data and its related processes.

**Action:**

- Investigate methodologies for the application of the concept of digital twins.

**4.2.9 Additional actions**

- Production of guidance and specifications simplified versions how to use of CEN/TC442 standards for use on small projects. As standards are developed to support all use cases, they can be challenging for SME and micro enterprises.  
CEN/TC442 will focus on supporting the needs of SMEs and micro enterprises. Work to date has aimed to produce one size fits all standards that are as a result cumbersome for small projects. Guidance documents are several pages long and do little to resolve the problem for a vast majority of stakeholders accustomed to simplified contractual relationships and a limited number of participants in their day-to-day work relationships. CEN 442 needs to acknowledge this and take steps to make standards more accessible while allowing sound information management to be available to all.
- Encourage convergence of common data environments throughout the life cycle of built assets  
Improved design, maintenance and management of built assets are enabled by agreed formats for structured information. Further work to define standard data environments requires better understanding of user needs so that information sets can be shared and calibrated. Agreed methods to streamline information can allow smooth and coherent transition between the procurement of built assets and the use of these assets when they are built.
- Prepare new smart standards for integrated BIM  
Current standards are focused on BIM based on collaborative working. When this becomes second nature, further developments will be within reach with a view to move away from information in silos. While silos can be coordinated, interaction by multiple parties with a single

digital twin for each asset or group of assets is desirable. A theoretical framework needs to be prepared so that standards related to integrated working become possible.

- Develop new standards for improved data exchange supporting information modelling and management processes for open BIM.

CEN 442 is an ideal platform for the development of new ideas. It unites all stakeholders in the construction community and can provide the context to enable better information exchange in the industry and increase efficiency.

### **4.3 Environmental sustainability aspects**

The Construction ecosystem uses about 50% of the raw materials taken from the earth, generates about 40% of all greenhouse gas emissions in Europe and generates a waste stream that has 13% of the EU total.

Key to the reduction of carbon emissions is the ability to perform complex performance analysis that creates a potential to focus on environmentally low-impact design, construction, operation, and demolition.

Standardized handling of information can help predict environmental performance and thereby improve decision on impact from:

- construction (emissions, resource consumption and waste),
- operation (energy consumption, construction product life-cycle, maintenance),
- construction in local setting (transport, exchange of heat/cooling and electricity, shade, wind effect, water treatment),
- reduction of the performance gap between design intent and performance “in use”,

## **5 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE CEN/TC WORK PROGRAMME**

Digitalization of the construction industry is evolving rapidly and the work on standardization needs to anticipate future developments.

As the use of BIM aims to encourage exchange, interoperability and unhindered teamwork, the work of CEN TC 442 will aim to make available techniques for information management accessible to all. Standards will be written with this in mind and eliminate restrictions, unnecessary complexity, useless jargon and any limitations that imply the need to have additional expertise when this is not justified.”

In line with objectives, the work of CEN/TC 442 will concentrate expertise from the Construction Sector. Guidelines and specifications will be prepared to ensure consistency between the deliverables produced by CEN/TC 442 for all types of assets in the built environment and the needs of end-users, be they public or private entities.

CEN/TC442 underlines the importance of focusing work and standards to support the needs of SMES and micro enterprises which constitute most companies in the building sector.

A relationship between the European Commission and CEN/TC 442 shall be maintained to ensure consistency of the deliverables produced by CEN/TC 442 with EC orientations.



Draft

## Annex A Glossary

### **API**

Stands for Application Programming Interface. It is a standardized access point to information and relations in a data model.

### **Asset management**

The profession and processes that includes multiple disciplines to ensure functionality during operation of the built environment by integrating people, place, process and technology. In a wider definition, it covers operations of assets.

### **Building application**

Covers both the process of and the actual application to local building authorities to get a permit to build and use a construction.

### **BIM - Building Information Modelling**

use of a shared digital representation of an asset to facilitate design, construction and operation processes to form a reliable basis for decisions (EN ISO 29481-1:2016 Preferred term CEN/TC442/WG01, 2018)

#### **Note 1- Building Information Modelling**

Is an industry term that covers the sharing of structured information for assets. “Sharing” requires consideration of processes and interoperability, “structured” requires the use of a common data schemas and “information” may depend on development of common terminology (CEN/BT/WG215, 2014 - not in accordance with CEN/TC442/WG1 preferred terms).

#### **Note 2 - A Building Information Model**

Can be visualized as a virtual geometrical representation of the real asset and can report object properties and relations. BIM gives an intuitive understanding of complex building information and supports many digital tools for effective information handling (CEN/BT/WG215, 2014 - not in accordance with CEN/TC442/WG1 preferred terms).

### **buildingSMART International**

Is the International, open and non-for-profit organization that has developed and maintains the IFC standard EN ISO 16739. buildingSMART International develops actual implementation based on their standard and works together with the industry to ensure implementation of Open BIM. buildingSMART International is formally recognized by ISO as an organization in cooperation.

### **Data Dictionary** based on EN ISO 12006-3.

ISO 12006-3:2016 specifies a language-independent information model which can be used for the development of dictionaries used to store or provide information about construction works. It enables classification systems, information models, object models and process models to be referenced from within a common framework.

### **EU BIM task group**

A pan-European approach to best practice in BIM (building information modelling). Bringing together national efforts into a common and aligned European approach to develop a world-class digital construction sector. [Link](#).

### **Facility**

physical structure, including the related site, serving one or more main purpose

### **Construction works**

everything that is constructed or results from construction operations. This term covers both building and civil engineering works.

### **Data model**

A specified set of entities and their related properties and attributes representing a virtual model of one or more domains structured by a modelling language. The buildingSMART Data Model is the same as the IFC data model.

### **Data dictionary**

A data-semantic dictionary specifying concepts (entities, properties, classification and other concepts) and their relations. A data dictionary defines entities and properties uniquely, understandable and machine readable. It is possible to connect different data dictionaries and to harmonize the understanding of the content we want to share. Such a harmonized dictionary of properties could be used for an unambiguous information exchange either in direct communication with Data dictionaries or other exchange flows based on IFC.

### **Exchange requirement (ER)**

Defined set of information units that needs to be exchanged to support a particular business requirement at a particular process phase (or phases)/stage (or stages). (EN ISO 29481-1:2016).

### **IFC**

Stands for Industry Foundation Classes. It is a neutral data format to describe, exchange and share information typically used within the building and facility management industry sector. IFC is the international standard for open BIM and registered as EN ISO 16739:2016.

### **Information Delivery Manual (IDM)**

Documentation which captures the business process and gives detailed specifications of the information that a user fulfilling a particular role would need to provide at a particular point within a project. (EN ISO 29481-1:2016).

### **Information Delivery Specification**

The same as an IDM.

### **IDM components**

Basic elements that form an IDM: Interaction maps/transaction maps, process maps and exchange requirements. (EN ISO 29481-1:2016).

### **Information unit**

Individual information item, such as a window identifier or a room depth. (EN ISO 29481-1:2016).

### **Interaction map**

Representation of the roles and transactions relevant for a defined purpose. (EN ISO 29481-1:2016).

### **Interaction framework**

Formal description of the elements of interaction, including definitions of roles, transaction, messages in transaction, and data elements in messages. (EN ISO 29481-1:2016).

### **Lifecycle**

Covers both the process perspective and the actual lifespan of a given physical structure. The life-cycle perspective focuses to improve the sum of performances of a physical structure in its various relation to e.g. function, people, environment and economy.

### **Model**

Representation of a system that allows for investigation of the properties of the system. (EN ISO 29481-1:2016).

### **Model View Definition (MVD)**

Computer-interpretable definition of an exchange requirement, specifically bound to one or more particular standard information schemas. (EN ISO 29481-1:2016).

**Note 1:** A model view definition (MVD) is also referred to as a view definition, a subset (of a schema) and a conformance class (CC) especially in ISO 10303. (EN ISO 29481-1:2016).

### **Object**

Part of the perceivable or conceivable world. (EN ISO 29481-1:2016).

**Note 1:** An object is something mental or physical toward which thought, feeling, or action is directed

### **Object library**

A set of virtual objects representing a physical construction object.  
An Object Library can be generic and product specific.

### **openBIM**

means the deployment of BIM based on open standards, not dependent on proprietary formats, allowing the separation of the information from the applications that manage it. In this document, BIM means always openBIM.

### **Property**

A single characteristic of an object or system. (not in accordance with CEN/TC442/WG1 preferred terms)

These definitions are provided as elements of understanding of the Business Plan. They could be modified following the work of CEN/TC 442/WG1.

### **Security-minded**

the understanding and routine application of appropriate and proportionate security measures in any business situation so as to deter and/or disrupt hostile, malicious, fraudulent and criminal behaviors or activities (EN ISO 19650-5)