EUROPEAN BIM STANDARDS

Tomi Henttinen, buildingSMART, Finland Chair
What is BIM?
3D versus BIM*?

3D model

*Visual*
- At best, as accurate as a photo
- Still, only visual information

Building Information Model (BIM)

*Technical...*
- All objects contain information and can be identified
- Can be utilized for machine to machine data exchange
- Enable computerized quantity surveys and other analyses
- And lot more...
Drawings = Human Readable

BIM = Machine Readable
BIM is also Building Information and Process Management
**BIM** is a way to handle digital information of built assets.

*It combines a digital twin of the asset and digital processes to design, build and maintain the asset.*
Why do we need **BIM** standards?

Standardized, digital information enables gradual automation of information management.
What is a standard?

A strict definition of standards only includes publications by official standardization bodies.

In practice, however, standardization-like harmonization takes place in many organizations:

- Official standardization organizations, like SFS, DIN, ISO, and CEN
- Organizations that are comparable with the above-mentioned, e.g. Open Geospatial Consortium (OGC) and buildingSMART International
- Industry consortiums, such as ETIM and PSK
Why Open Standards?

“All the stakeholders should use the best tool for their job. In order to exchange BIM based information between these tools, we need an open, common data exchange format.”

Aulis Kohvakka, CEO of Senate Properties

IFC is the Open Data Exchange Format for Building Industry

CEN TC442
BIM Standardization in Europe
# Structure of CEN/TC 442 – Building Information Modelling - BIM

**Chair Øivind Rooth - Secretary Lisbet Landfald**

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<th>WG 2: Exchange Information</th>
<th>WG 3: Information Delivery Specification</th>
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<td>Germany, Convener: Thomas Liebich</td>
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| **TG 1** PL: Marzia Bolpagni, Italy | **TG 1 PL:** Marie C Coin, France  
Co-lead Manfred Huber, Switzerland | **TG 1 PL:** Frederic Grand, France |
| WI 442009 prEN 17412 BIM – Level of Information Need - Concepts and principles | WI 442022 CEN/TR 17439 Guidance on how to implement EN ISO 19650-1 and -2 in | WI 442007 prEN ISO 23386  
Building information modelling and other digital processes used in Construction – Methodology to describe, author and maintain properties in interconnected dictionaries |
| WI 442014 and 442015 prEN ISO 21597-1 and -2 | **TG 2 PL:** Philip Ridgway, France  
**TG 2 PL:** Tomi Henttinen, Finland | WI 442010 prEN ISO 23387  
Building Information Modelling (BIM) - Data templates for construction objects used in the life cycle of any built asset - Concepts and principles |
| VA ISO lead | WI 442024 Guideline for the implementation of BIM Execution Plans (BEP) and Exchange Information Requirements (EIR) on European level based on EN ISO 19650-1 and -2 | WI 442008 prEN 17473 Framework for product data templates based on harmonized technical specifications under the Construction Products Regulation (CPR), and how to relate the product data templates to Industry Foundation Classes (IFC) |
| Team 1 PL: Klaus Angelwort, DE  
WI 442018 Exchange structure for product data templates and product data based on ifcXML | WI 442023 Guideline on how to understand and utilize EN/ISO 29481 Building information models - Information delivery manual - Part 1: Methodology and Concepts | **TG 3 PL:** Benno Koherst, Netherland |
| Team 2 PL: Daniel Said, France  
WI 442033 Exchange structure for product data templates and product data based on ifcXML - Part 2 Requirements and configurable products | **TG 4 PL:** Volker Krieger, DE | **TG 3 PL:** Benno Koherst, Netherland |
| WI 442032 Common Data Environments (CDE) for BIM projects – Open data exchange between platforms of different vendors via an open CDE API | WI 442031 prCEN/TR Framework and Implementation of Common Data Environment Solutions, in accordance with EN ISO 19650 | WI 442021 Building Information Modelling (BIM) - Modelling and linking between semantic ontologies |

**TG 1**  
WI 442007 prEN ISO 23386  
Building information modelling and other digital processes used in Construction – Methodology to describe, author and maintain properties in interconnected dictionaries

**TG 2**  
WI 442024 Guideline for the implementation of BIM Execution Plans (BEP) and Exchange Information Requirements (EIR) on European level based on EN ISO 19650-1 and -2

**TG 3**  
WI 442023 Guideline on how to understand and utilize EN/ISO 29481 Building information models - Information delivery manual - Part 1: Methodology and Concepts

**TG 4**  
WI 442031 prCEN/TR Framework and Implementation of Common Data Environment Solutions, in accordance with EN ISO 19650

**TG 5**  
Norway, Convener: Øivind Rooth

**TG 6**  
Norway, Convener: Thomas Jenssen

**TG 7**  
France, Convener: Manuela Tancogne-Dejean

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CEN TC442 Status Berlin 09/2019 - Tomi Henttinen
# CEN TC 442 Work Programme

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<th>Work Item</th>
<th>Published standards and ongoing projects in CEN/TC 442</th>
<th>WG Task Group Vienna Agreement (in green)</th>
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<th>Status/next stage</th>
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<tr>
<td>WI00442001</td>
<td><strong>EN ISO 29481-1:2017</strong> (WI=00442006) Building information models - Information delivery manual - Part 1: Methodology and format (ISO 29481-1:2016)</td>
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<td>WI00442002</td>
<td><strong>EN ISO 16739:2016</strong> (WI=00442002) Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries (ISO 16739:2013)</td>
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<td>WG 4/TG 1 (PL France) Vienna Agreement CEN lead</td>
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<td>Enquiry End date: 2019-04-09 Approved in CEN and ISO Next stage: FV/FDIS start Nov/Dec 2019 Publication: 2020-04-17</td>
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<td>WI00442008</td>
<td>prEN 17473</td>
<td>Building information modelling (BIM) — Data templates for construction objects used in the life cycle of any built asset — Data templates based on harmonised technical specifications under the Construction Products Regulation (CPR) Note: Title modified</td>
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<td>WG 4/TG 2 (PL Norway)</td>
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<td>Next stage: Enquiry Start: 2020-01-16 End: 2020-04-09</td>
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<td>prEN 17412</td>
<td>Building Information Modeling - Level of Information Need - Part 1: Concepts and principles</td>
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<td>WI00442010</td>
<td>prEN ISO 23387</td>
<td>Building Information Modelling (BIM) – Data templates for construction objects used in the life cycle of any built asset – Concepts and principles (ISO/DIS 23387:2019) Note: title modified</td>
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<td>VA Adoption of ISO standard as EN ISO 60.60 Published</td>
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<td>WI00442013</td>
<td>prEN ISO 16757-2</td>
<td>Data structures for electronic product catalogues for building services - Part 2: Geometry (ISO 16757-2:2016)</td>
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## CEN TC 442 Work Programme

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<td>WI 00442021</td>
<td>Building Information Modelling (BIM) - Modelling and linking between semantic ontologies</td>
<td>4/TG 3 (NL Netherlands)</td>
<td>Proposal of PWI 2018-07-30 (00.50) Next action: Proposal of WI for approval (activation) CIB end 2019-12-29</td>
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<td>WI 00442022</td>
<td>prCEN/TR 17439 Guidance on how to implement EN ISO 19650-1 and -2 in Europe</td>
<td>3/TG 1 (FR France)</td>
<td>Vote on TR end 2019-11-07 Approved Publication 2020/03-07</td>
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<td>WI 00442025</td>
<td>prEN ISO 16739-1 Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries -- Part 1: Data schema</td>
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<td>Enquiry End 2019-10-10 Approved Decision to skip FV by 2019-11-24</td>
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<td>WI 00442027</td>
<td>prCEN/TR BIM in infrastructure – standardization need and recommendations</td>
<td>6 (NO Norway)</td>
<td>Proposal of PWI 2019-05-16</td>
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Note: Adoption of ISO and EN ISO
# CEN TC 442 Work Programme

| WI 00442028 | **prEN ISO 19650-4**  
Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling — Part 4: Information exchange | Vienna Agreement, ISO lead  
Developed by ISO/TC 59/SC 13/WG 13 | 20.00 | New project approved 2019-07-15 |
| WI 00442029 | **LOIN Part 3**  
"Building Information Modelling – Level of information need – Part 3: Data Schema" | WG 2/TG 1 (PL Italy) | 00.60 | Proposal of PWI 2019-09-11 |
| WI 00442030 | **LOIN Part 2**  
Building Information Modelling – Level of information need – Part 2: Guidance for application | WG 2/TG 1 (PL Italy) | 00.60 | Proposal of PWI 2019-09-11 |
| WI 00442031 | **prCEN/TR**  
Framework and Implementation of Common Data Environment Solutions, in accordance with EN ISO 19650 | WG 3/TG 4 (PL Germany) | 00.60 | Proposal of PWI 2019-09-10 |
| WI 00442032 | **prCEN/TR**  
Common Data Environments (CDE) for BIM projects –Open data exchange between platforms of different vendors via an open CDE API | WG 2/TG 4 (PL Germany) | 00.60 | Proposal of PWI 2019-09-13 |
Next stage: First WD by 2020-02-22 |
WI 442023 Guideline on how to understand and utilize EN/ISO 29481 Building information models - Information delivery manual - Part 1: Methodology and Concepts

CEN TC442/WG3/TG3

Tomi Henttinen
Use Case is a starting point of the IDM development. It defines the needs for information exchange for particular business process. Use Case can be also an independent concept without further development to IDM especially if it does not generate any information exchange requirements.

**Use Case shall describe:**
- What are the business needs for the information exchange and who is able to specify them?
- Who are the actors and what are their roles and interests?
- How can the information exchange be prepared and handled?
- Will existing agreements, contractual conditions, standards, etc. support the information exchange?

**Process Definition**
At least one of the following
- Process map
- Interaction map

**Exchange Requirements**
- Information delivery requirements in non-technical format

**Exchange requirements** defines the information that shall be exchanged to support the Use Case.
- It is intended to provide the information in non-technical terms.
- It should create a clear understanding of the information needs and exchange requirements of the individual actors in the process.
- It can be used to create a technical specification used to define requirements in machine-readable form.
EN ISO 29481-1 Information Delivery Manual Development Steps

1. Strategic Goal
2. Use Case
3. Process Definition
4. Exchange Requirements
5. Model View Definition
6. BIM QA
In order to be more precise, the IDM should be developed further towards Model View Definition. This would make possible machine readable QA of the information exchange and other digital implementations.
How to use IDM(s)
Setting up the Information Requirements and Deliveries with IDMs

EN ISO 29481 part 1 - Information Delivery Manual aka IDM - standard provides concepts and methods to specify any information delivery process and its exchange requirements.

The business need for the information delivery is called **Use Case.** This defines the **purpose of the information exchange.**

In the TC 442 WI 00442023 - Guidance for IDM - **gives instructions** how to use the standard to identify and to specify BIM requirements and deliverables.
Setting up the Information Requirements and Deliveries with IDMs

The Appointing Party may describe its information delivery needs and exchange information requirements utilizing these Use Cases. The IDM description of the Use Cases provides the project team a source for BIM Execution Plan development.

All the BIM related Regulatory, Organizational, Asset and Project requirements for information deliveries can be described using IDMs. These IDMs can be collected a catalogue of Use Cases that form an IDM library.
Defining Information Requirements and Deliveries with IDMs
Defining Information Requirements and Deliveries with IDMs

BIM delivery is also a source of information for Project, Asset, Organizational and Regulatory Models that may be re-used as an initial data in the life-cycle.

The QA for the BIM deliveries can be carried out using the same IDM that described the Exchange Requirements.
How we plan to use IDMs in COBIM2020

Part 1: Concepts and principles

EN ISO 19650-1

Part 2: CAPEX Phase

EN ISO 19650-2

Use Cases define the User Requirements (→ IDM defines Exchange Requirements). The project specific Use Cases are recorded in EIR and BEP documents.

Part 3: OPEX Phase

EN ISO 19650-3

Use Cases / SFS EN ISO 29481

EIR
Clients requirements for Information

BEP
BIM Execution Plan

IDM

IDM

IDM

IDM

IDM

IDM
THANK-YOU

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GUIDANCE FOR EN ISO 29481-1

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