



# **CECAPI - CAPIEL**

# **Building information modelling (BIM)**

## **Properties of electric devices**

## **Questionnaire to national organisations**

### Introduction

#### Market needs

The construction industry is one of the largest European industries (10% of the GDP of the EU and 20 million jobs). As noted by commentators such as the World Economic Forum, the construction industry should increase its competitiveness and must become more sustainable. Key drivers to make this happen are Information and Communications Technology (ICT) supported by standardization. Current practices and studies show how traditional processes repeatedly experience dramatic information loss, especially in the steps between design, construction and operational stages. Digital processes often are supported with manual processes to build and rebuild information. Therefore:

- Construction cost is increased by splitting up of processes and lack of communication;
- Without a common language, there are often significant communication errors and loss of
- information;
- The same information is 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.

BIM (Building Information Modeling) is a digital environment that allows all actors in the building value chain to exchange digital information between their respective digital tools and thus ensure an information continuum throughout the lifecycle of the building: programming, design, construction, operation, deconstruction. BIM includes several components, including a language, the organization of processes, information storage capacities, ...

The process Building Information Modelling (BIM) is a way of structuring infrastructure and building information. BIM refers to the use of a shared digital representation of a built object 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 Building Information Model (BIM) 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 support many digital tools for effective information handling. BIM improves handling of information and is a condition for instance to tackle Lean Design and Construction, digital access to maintenance of project as well as product information during Facility Management or Operation. With a BIM information-based 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 supported by standards used across the European construction industry.

#### Structuration of the BIM standardization works

The pre-standardization and standardization works on BIM are carried out at 3 levels:

- National levels, under Governmental initiatives, with buildingSMART National Chapter works, Standardization Organization works and, Professional Organizations;
- European level: CEN TC442;
- International level: ISO TC 59 / SC 13.



The works carried out are works on **BIM Processes and Tools**, **but not** standardization work on products and systems, even if they can be driven to use product properties during their works.



#### The role of CEN/TC 442 and ISO TC 59 / SC 13

The role of CEN/TC 442 and ISO TC 59 / SC 13 is to produce standards needed for implementing the BIM in construction sector. The objective is not to replace other TCs and organizations in charge of products and systems standardization, nor transversal TCs (e.g.: acoustic, environment, Eurocodes...), but to develop and provide methodologies and tools helping to integrate BIM in their respective fields of activity. Accordingly, conditions and method of collaboration with technical committees and organizations should be investigated and specified.

These methodologies and tools should be recognized amongst CEN, ISO and specific product/system sectors such as IEC (by others TCs) as reference. On its part, each product, system or transversal TCs should take over ship and integrate these tools and methods offered to identify and provide directly the BIM elements needed, related to their field of activity or expertise.

#### buildingSMART International (bSI)

buildingSMART International, global authority to drive the transformation of the construction environment, aim to promote increasing international consensus on specific standards to accelerate implementation and uptake for mutual benefit.

Chapters are national membership organizations sharing the vision and goals of buildingSMART International. Chapters also develop and promote the use of openBIM in their countries. The buildingSMART Data Dictionary (bSDD) is a library of objects and their properties. It's used to identify objects in the built environment and their specific properties regardless of language.



Being integrated to bSDD as a Domain, as well as following the international standards for experts and objects / properties management, help for interconnecting different dictionaries. ETIM International, and many countries already announced their integration to bSDD.

### Questions

#### **BIM processes and tools:**

- BIM Guides
- Specification / Generic / Manufacturer Objects
- Dictionaries: platform / Experts & Objects/Properties Management / ...
- Format for Exchange / Requests / ...

1: Are such works carried out in your country?

Yes, all of the above. The UK has invested a lot of time, effort and resource in developing the suite of 1192 documents BS1192:2007 and PAS1192 2 to 6:

- BS1192:2007 Collaborative Working Practices
- PAS1192-2 Information Management Capital/Delivery Phase [free to download]
- PAS1192-3 Information Management Operational Phase [free to download]
- PAS1192-4 Collaborative Production of information (COBie) [free to download]
- PAS1192-5 Security [free to download]
- PAS1192-6 Health and safety [free to download]

These cover the full range of BIM knowledge to help deliver construction projects within BIM Level 2. BEAMA recognised early on the importance of a product manufacturer voice in the development in all the above guidance.

Other useful guidance documents have been developed by relevant organisations that vary from being 'free' to 'paid-for' documents.

BSI Groups under the guidance of the BSI lead Committee B/555 have developed the 1192 suite of documents and are now heavily involved in the development of the suite of ISO19650 standards which will, over time, supersede all the 1192 documents. ISO19650 Parts 1 & 2 will be published in November 2018 and will replace the BS1192:2007 and PAS 1192 2. ISO19650 Part 3 is currently being worked on and is expected to be published at the end of 2019. Work is shortly due to start on ISO19650 Part 5.

For all the other points the UK is involved in all the relevant standards development committees e.g., CEN TC442 working groups 2,3 & 4 (WG2 – Exchange Information; WG3 – Information Delivery Specification; WG4 Support Data Dictionaries) as well as supporting all the ISO19650 drafting committees listed above. BEAMA is directly involved in the CEN working groups and provides input to all the reviews/drafts that come out of the ISO committees.

#### 2: Which organization(s) is (are) governing?

The main standards activity is coordinated through BSI (B/555 committee). CEN manage the TC442 working groups as well as the overarching TC442 strategy group.

Lead organisations for guidance materials are:

- <u>UK BIM Alliance</u> Sponsorship funded with the remit to widen the take-up of BIM level 2 to 75% of the construction industry by 2020. BEAMA are a funding sponsor of the UKBIMA. The UKBIMA have also recently merged with Building SMART and are now the UK National Chapter.
- <u>CIBSE</u> (Chartered Institute of Building Services Engineers) through their newly formed Society of Digital Engineering (SDE) including work on industry-based product data templates (PDTs) through their BIMHAWK project.

- <u>Centre for Digital Built Britain</u> (CDBB) which is a government sponsored organisation mainly made up of academics.
- <u>BRE</u> (Buildings Research Establishment) & CPA (Construction Products Association) working on a joint data dictionary and product data templates (PDTs) – through their LEXICON project Note there is ongoing debate between CIBSE and BRE / CPA on the format of data dictionaries and PDTs.

3: Who is taking part to these works (Standardization Organizations / buildingSMART National Chapter / Professional Organizations / ...)?

All the above - as listed previously. In addition, several BIM4 groups have been set up e.g., BIM4M2 (BIM for Manufacturers and Manufacturing) which aim to represent the relevant industry sectors on their BIM journey. These BIM4 groups all operate as independent groups but are now all linked with the UKBIMA as the coordinating body.

4: Are these works considering the CEN TC 442 and ISO TC 59 SC 13 works? Especially:

- Works on Experts & Objects/Properties Management: Pr EN ISO 23386
- Works on Objects: Pr EN ISO 23387

There is a lot of activity going on in this area in all the above groups and there is a need for much better coordination between them all.

Note - There has been a lot of discussion on clauses 6 and 7 of Pr EN ISO 23386 where the draft text has been interpreted as seeking to establish CEN as a personnel approval body for experts on product data. It is hoped this issue will soon be resolved

#### Platform for Dictionary / Experts & Objects/Properties Management

5: Name (or Project Name)?

LEXICON & BIMHAWK as mentioned above.

6: Is it (will it be) integrated to bSDD as a Domain?

BIMHAWK links with bSDD but it is unclear as to the LEXICON relationship with bSDD (work in progress). It is also unclear of the relationship between LEXICON and BIMHAWK

7: If not, will it be interconnected with bSDD and/or other dictionaries?

We don't know the answer to this.

#### Other tools:

8: Are other tools being developed?

This area is producing a lot of activity without too much coordination. There are known conflicts between various tool developers and it is all a bit of a mess. There is also the need for these tools to link with other existing, well established tools e.g., ETIM, Digital Object Identifier, Smart CE Marking (led by Construction Products Europe).

Our industry needs to take more of a proactive input to these discussions to help shape the outcomes rather than have something put upon us which is not fit for purpose.

#### Products and systems (All domains):

- Specification / Generic / Manufacturer Objects
- Properties
- System modelling

#### 9: Have such works already started in your country? For which products?

Yes to all the above but the same conflicting views from various parties mentioned previously exist. Software providers are also producing their own bespoke tools which will result in manufacturers having to invest in more than one solution, thus increasing costs, the exact opposite to what BIM is supposed to achieve. Software providers are also creating their own 'standards' which are not official 'standards' at all and is highly confusing for the uninitiated. In terms of manufacturer objects, there is no industry uniformity to this. It is up to the individual manufacturer to make a business decision.

10: Which organization(s) is (are) governing?

#### Varied and un-coordinated.

11: Who is taking part to these works (Standardization Organizations / buildingSMART National Chapter / Professional Organizations / ...)?

All the above plus commercial software suppliers

#### Electrical Products and systems (Electrical domain):

- Specification / Generic / Manufacturer Objects
- Properties
- System modelling

#### 12: Have such works already started in your country?

Yes - as mentioned above, BEAMA are very proactive in all the various committees, groups, bodies etc., to make sure that the needs of our product range are understood and incorporated in the development process.

13: Which organization(s) is (are) governing?

Refer to answers to question number 2 above.

14: Who is taking part to these works (Standardization Organizations / buildingSMART National Chapter / Professional Organizations /...)?

Refer to answers to question number 3 above

15: Which stakeholders (Engineers / Contractors / Facility Managers / ...)?

All the above mainly led by the BSI and professional institutions e.g., CIBSE. Also, as previously mentioned BEAMA are a major stakeholder in all the UK discussions.

#### 16: For which products?

All the products covered by BEAMA which in turn relates to all the products covered by CECAPI. In addition, CIBSE are doing a good job in ensuring that the full range of building services products and installations utilised within the built environment have a voice.

17: What are the Working Groups involved (National / CEN-CENELEC / IEC equivalents)? All the groups mentioned in question 2 above.

18: What stages of the lifecycle of buildings are considered for electrical objects and properties? All the RIBA (Royal Institute of British Architects) Plan of Works for construction stages 0 to 7.