P03 – Classifications and BIM

Status report ICIS DA 2015
Agenda

Project team

The scope First draft and content

Important topics

Finishing the project
Project team 2013-2015

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At the moment 32 pages

Contributions are still to be made
The scope

Problem statement:
Most classification tables of the construction industry today (and in the current ISO 12006-2 standard as Framework for classification of construction information) aims at classifying documents with contained information – and often for very specific parties, stages or documents of the construction lifecycle.

The construction industry moves towards a model- and data based data-handling and broader use and sharing of information (BIM) across the parties and the stages of the construction lifecycle. How can a contemporary classification support the new ways of working and the data-handling, and in which areas (of interest for ICIS members), will the application and use of such a classification be beneficial?
Content

Executive summary
Introduction - The challenge of BIM to classification

1. BIM
   1.1 Definitions of BIM
   1.2 Objects
   1.3 Databases

2. Classification, defined language and structuring of information
   2.1 The revision of ISO 12006-2
   2.2 The international classification survey
   2.3 Demands for classification and structuring of information summarized
   2.4 Terms and definitions for concepts and classes
   2.5 Object classes and classification tables
   2.6 Type-of relations and where classification might stop
   2.7 Part-of relations, structure and identification
   2.8 Combining classification and structuring
   2.9 Object occurrences, types and instances and identifiers
   2.10 Properties

3. Implementing ISO 12006-2
   3.1 General requirements for BIM-ready classification systems

4. Applying classification in BIM
   4.1 In general
   4.2 Geometry and modelling [...] 
   4.3 Structuring and simulation [...] 
   4.4 Specification [CSC??] 
   4.5 Costing, Cost estimation, quantity take off and tendering 
      [Barbora (URS), Albert Müller (CRB)] 
   4.6 Manufacturer information [...] 
   4.7 Timeline [Forrest Grierson, Drew Teal (CSC)] 
   4.8 Mapping & bS Data Dictionary [John/NBS]

From the draft of the introduction and from the executive summary:
With....
- the international survey from 2012
- the revision of the classification standard ISO 12006-2
- and experiences from current nationally based classification work
... a lot of issues were addressed and questions raised about classification in construction, as we know it today.

The report reflects the mixed situation of a journey from an analogue to a gradually increasing digital practice... In order not only to refer to the current state of the art it is intended also to list possible and debatable demands for the future use of classification in a BIM context and possible actions to be taken.

... the BIM-potential of the revised ISO 12006-2:2015 edition in combination with other relevant international standards has probably still to be released.
Some important topics:

- The survey about classification and rev. of ISO 12006-2
- Common language, terminology and definitions
- Classification and properties
- Classification and Identification
Common language, terminology and definitions

Type-of classification ...as we know it

<table>
<thead>
<tr>
<th>Classification hierarchy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subclass are types of a superordinate class.</td>
</tr>
</tbody>
</table>

### Class
- Element
  - wall
  - roof
  - floor
- Insulation
  - wall batts
  - duct insulation

Can be handled as two separate classification tables or combined into one. A lot of construction classification systems make the combination of the generic and the subtype classes.
Type-of classification and properties - choice or combi...

A typical or traditional classification with different classification tables for different participants and purposes and specialized subtype classes incorporating more and more properties embedded in the code.

A generic and stable classification with one entry class that is used all through the lifecycle combined with an increasing number of properties.
Classification and properties

A generic and stable classification that is used all through the lifecycle combined with an increasing number of properties that might be selected as property sets through defined information levels according to a specific purpose (e.g. an IDM)
Part-of structuring – the compositional view

**Composition hierarchy**
Subordinates are parts of a superordinate whole.

<table>
<thead>
<tr>
<th>Whole</th>
<th>Wall system</th>
<th>Ventilation system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts</td>
<td>stud</td>
<td>plate</td>
</tr>
<tr>
<td></td>
<td>insulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fan</td>
<td>insulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ventilator</td>
</tr>
</tbody>
</table>

With BIM it is of interest how composition is handled through the use of building models and structuring of information. Use of Reference Designation System from ISO/IEC 81346-1 describes the basic rules of structuring (system-of-systems) and creation of reference designations (mentioned but not normative in ISO 12006-2).
Combining classification and identification (ISO 12006-2)

Combining classification with reference designation in order to handle objects as compositional part-of systems could be very useful with BIM and new ways of designing and executing buildings.
Complexity in architecture – Cross section, Facade system

The Maersk building, Panum, C.F. Moller architects
Classification – what object?

- **B Wall system**
  - UBA Service duct
  - WDB Cable
  - UNA Frame
  - XTA Opening for switch
  - EPE Radiator
  - QQA Window
  - NNA Pane
  - UQA Permanent mechanical fixing

- **H Cooling and Heating system**
  - ULT Bearing plate
  - RQG Shutter
  - RQG Insulation

- **K Electrical system**
  - MAC Electric actuator
  - NAC Grating

- **L Automation system**
  - KA Solar screening system
  - UNA Frame

The Maersk building, Panum, C.F. Moller architects
Classification + Identification – which object in which system?

-B Wall system
-AD Wall Assemblage
-AD.RQA Insulation
-AD.NCB Wallcovering
-AD.NCB.XTA Opening for switch
-AD.UQA Permanent mechanical fixing

-QQA Window
-QQA.UNA Frame
-QQA.UNA Pane

-KA Solar screening system
-KA.ULT Bearing plate
-KA.RQA Shutter
-KA.RQA.NA UNA Frame
-KA.RQA.NAC Grating

-H Cooling and Heating system
-WPA Heating pipes
-EPE Radiator

-K Electrical system
-UBA Service duct
-WDB Cable

-L Automation system
-MAC Electric actuator

The use of Reference Designation will also be able to absorb and organize the elements modelled by e.g. specification or calculation and not being modelled in the building model.

The Maersk building, Panum, C.F.Moller architects
Configuring the model of object-oriented information

- **B Wall system**
  - B.AD Wall Assemblage
  - B.AD.RQA Insulation
  - B.AD.NCB Wallcovering
  - B.AD.NCB.XTA Opening for switch
  - B.AD.UQA Permanent mechanical fixing

- **B.QQA Window**
  - B.QQA.UNA Frame
  - B.QQA.NNA Pane

- **B.KA Solar screening system**
  - B.KA.ULT Bearing plate
  - B.KA.RQG Shutter
  - B.KA.RQG.UNA Frame
  - B.KA.RQG.NAC Grating

- **H Cooling and Heating system**
  - H.WPA Heating pipes
  - H.EPE Radiator

- **K Electrical system**
  - K.UBA Service duct
  - K.WDB Cable

- **L Automation system**
  - L.MAC Electric actuator

Structured information for
- Configuring Construction Entities
- Quality Management
- Cost Estimation
- Etc.

The Maersk building, Panum, C.F.Moller architects
Work to be done to finish project #3

Thorough reading and commenting on the draft
More illustrations, more examples
More examples from implementing and using classification with
- Geometry and modelling [...]  
- Structuring and simulation [...]  
- Specification [...]  
- Costing, Cost estimation, quantity take off and tendering [...]  
  Manufacturer information [...]  
- Timeline [...]  
- Mapping & bS Data Dictionary [...]
Thank you for your attention

Questions and comments are most welcome before finishing the project!