cuneco

center for
produktivitet
i byggeriet

bips

cuneco – a part of bips

Realdania

DEN EUROPÆISKE UNION
Den Europæiske Fond
for Regionaludvikling
Vi investerer i din fremtid

center for productivity in construction

Friday April 13th 2012
RESTA 2012

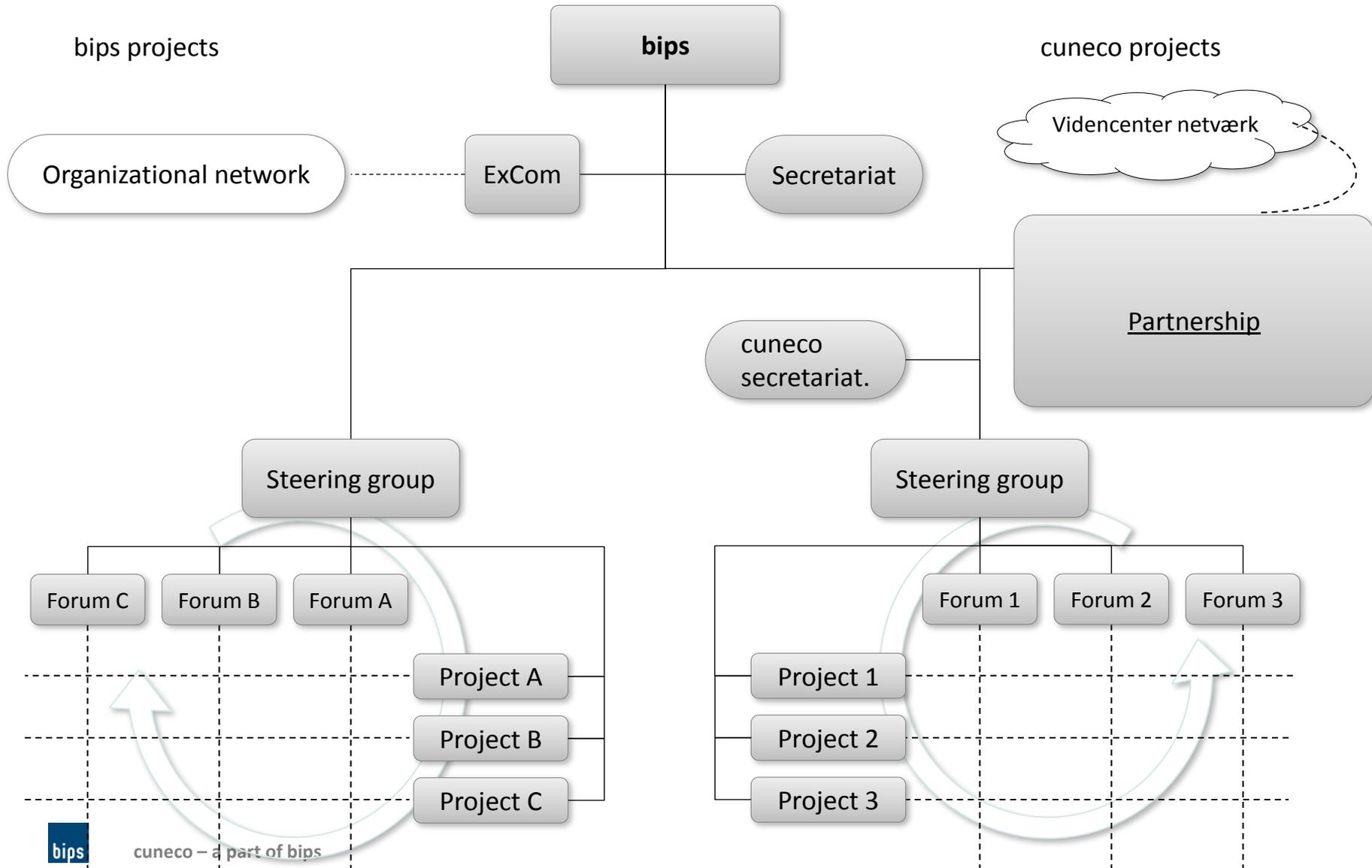**Organisation, methology and areas of focus**

Agenda

- What is cuneco?

- How are we organized?

- What are the prerequisites for our work?

- What are we focusing on?

- What is our methodology?

- What are our experiences so far?

What is cuneco?

- cuneco is a development project carried out by the bips association from 2010 to 2014
- bips is a public nonprofit association for professional companies related to the construction industry in Denmark
- Currently bips has approximately 600 members
- The day to day operations of cuneco is carried out by a secretariat consisting of 6 persons

Organization

A network organization in 5 levels

Partnership

- Overall business responsibility
- Sets the strategical aim of the development

Steering group

- Prioritizing and managing the focus areas and the projects
- Assuring the accordance between the business needs and the development

Network

- Dialogue, knowledge sharing and feedback supporting the work carried out

Fora

- Domain specific input supporting the development projects

Projects

- Project development carried out by domain experts from the Danish and the international building industry

The Partnership

Orgaizational network

Education and knowledge institutions

Danish Standards

The Steering Group

- Bent Feddersen, Rambøll (chairman) – Consulting Engineer

- Lars Coling, Holm & Grut - Architect

- Clars Danvold, Building and Properties Agency - Owner

- Magnus Sommer, Cembrit – Product Manufacturer

- Flemming Vestergaard, DTU - Education

- John Adelhøj, DS - Standardization

- Lars Kjærulf, YIT – Technical Contractor

- Anders Kudsk, NCC – Construction Contractor

- Michael Schou, White - Architect

Lessons learned from the Digital Construction initiative

- Focus on user demands and requirements – do not develop anything unless you can explain what it is good for

- Engage the software industry – if our results are not implemented in software products they are not going to be used

- Establish a business model – you are not doing anyone a favor by developing something that you will not support afterwards – and support costs money
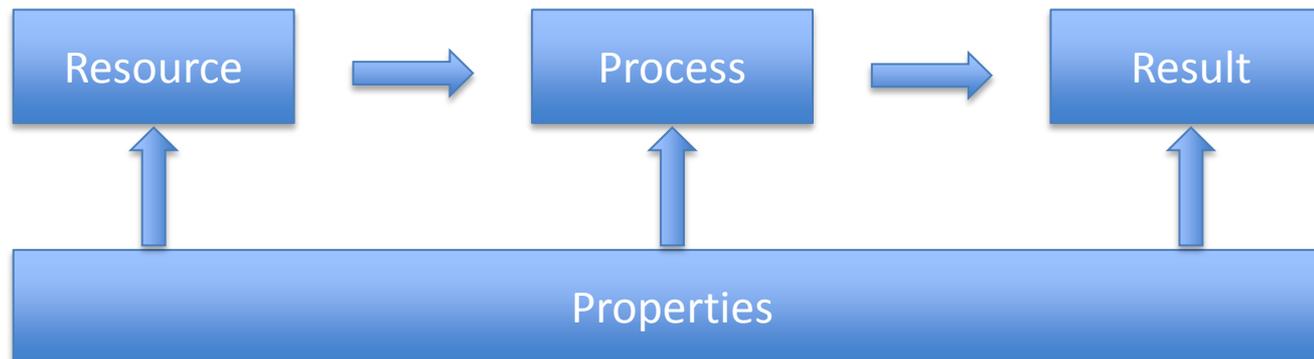
Purpose

- The purpose of cuneco is to develop, test and implement digital standards which support cooperation and productivity in the build environment from cradle to grave

- The results must be compatible with international standards and implementable in the software solutions used in the industry

- All development work must be based on documented requirements

- The results will be published within the framework of cuneco classification system – CCS

- A business model will be established for the support, maintenance and future development of the standards

Areas of focus

- Classification
- Properties
- Information levels
- Measurement rule
- Testing
- Implementation in the industry
- Implementation in education
- Knowledge portal
- The cuneco server

- All the work within these areas are based on the projects carried out in the Digital Construction Initiative and follow-up projects

Classification

- Purpose: establish a framework for classification of objects within the domains:
    - Resource (materials, equipment, actors and information)
    - Process (Phases and processes)
    - Result (constructions and spaces)
    - Properties
- Based on DBK2006

Property data

- Purpose: establishing a framework for exchanging property data

- This involves:

  - Naming conventions

  - A structure for property sets related to object classes

  - A format for exchanging property data

  - An online forum for creating and maintaining properties

Information levels

- Purpose: Establishing a framework for the definition of agreements on which properties are to be found in a building information model at a certain stage

- This involves:

  - Establishing the number of levels

  - Establishing naming conventions for levels

  - Describing the connection between user processes and information levels

  - Establishing which properties are associated with each level based on input from domain users

Measurement rules

- Purpose: To establish a framework for digital tendering
- This involves:
  - Specifying data for grouping records in a procurement document
  - Specifying the important properties for the contractor in order to set the price
  - Specifying a format for the procurement documents
- This work is partly based on bips Measurement rules from 2008 and partly on international works within this area

Testing

- Purpose: To test the results from the development projects in order to:

    - Make suggestions for adjustment in the results from the projects

    - Form the input for Best Practise manuals and other input for the implementation projects

- We plan to carry out about 5-10 test projects in our project period

Implementation in the industry

- Purpose: To create a support organization for companies who wish to start using the cuneco standards in their projects and buildings
- This involves:
    - Cooperating with software vendors in order to get the results implemented in software
    - Cooperating with companies who provide educational services for the industry
    - Establishing a support organization consisting of domain experts

Implementation in education

- Purpose: To ensure that the educational institutions are able to educate the students in the use of the cuneco standards

- This involves:

  - Cooperating with educational institutions for craftsmen, constructors, engineers, architects etc.

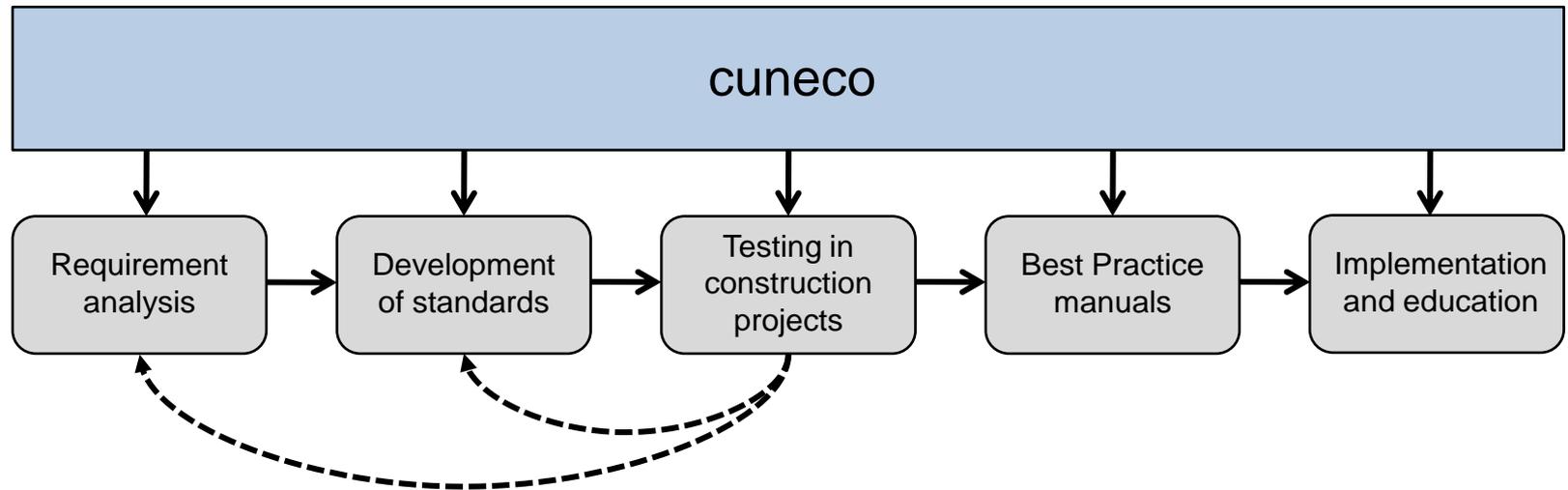 - Cooperating with knowledge institutions

Knowledge portal

- Purpose: To inform and involve the entire network
- This includes:
  - Information about cuneco
  - Information about ongoing projects and results
  - Recruitment of domain experts for the cuneco projects
  - Information about cuneco seminars and workshops
  - Establishing an online forum in order to maintain a dialogue with the network
- Currently the website (www.cuneco.dk) is in Danish but we plan to maintain english-language paged describing our results

The cuneco server

- Purpose: To make the cuneco standards available online for users and software solutions
- This includes:
    - Access to classification tables
    - Interpretation of classification tables
    - Access to the property database
    - Access to definition of information levels
    - Etc.
- More on this later

The development process

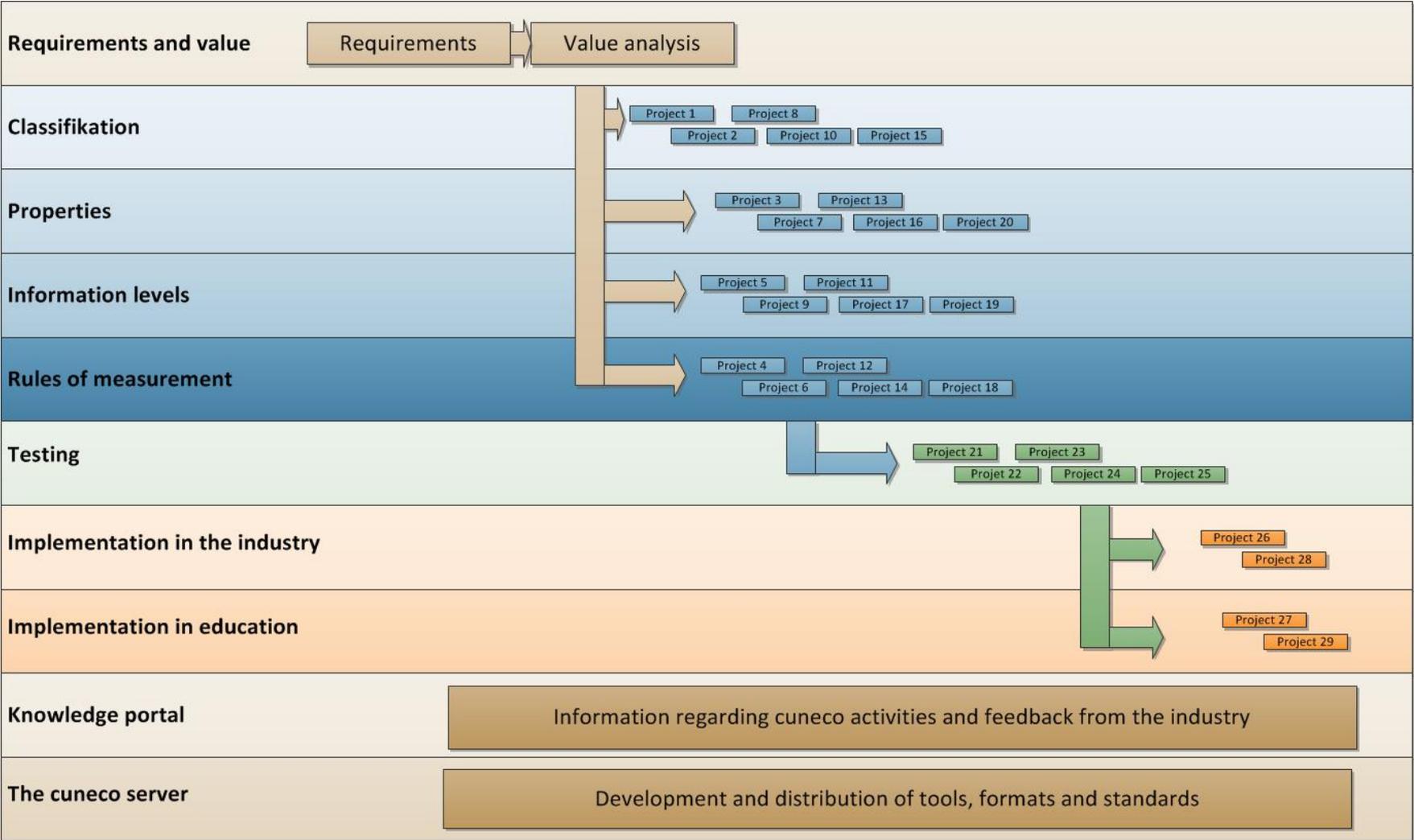The approach is based on a principle of creating value:

- Based on requirement analysis
- The development of standards which create value
- Compatibility with national and international standards
- ICT suitability and implementation in software
- Testing virtually and in real construction projects
- Implementation in companies and educational institutions

Project model

1. The steering group creates a project description with success criteria and suggested profiles for the project group
2. The secretariat recruits the project group
3. The project group makes a suggestion for a solution description and budget based on the project description
4. The solution description is approved by the steering group
5. The project i developed and the result is presented for the steering group in the process
6. When the result i approved by the steering group a public hearing is conducted
7. The result is published

The entire process is carried out within a timeframe of 3-6 months by a group of 3-5 people

Conceptual project plan

| Requirements and value | Requirements | Value analysis |

Classifikation
- Project 1, Project 8
- Project 2, Project 10, Project 15

Properties
- Project 3, Project 13
- Project 7, Project 16, Project 20

Information levels
- Project 5, Project 11
- Project 9, Project 17, Project 19

Rules of measurement
- Project 4, Project 12
- Project 6, Project 14, Project 18

Testing
- Project 21, Project 23
- Projet 22, Project 24, Project 25

Implementation in the industry
- Project 26
- Project 28

Implementation in education
- Project 27
- Project 29

Knowledge portal — Information regarding cuneco activities and feedback from the industry

The cuneco server — Development and distribution of tools, formats and standards

January 1st 2011   June 30th 2014
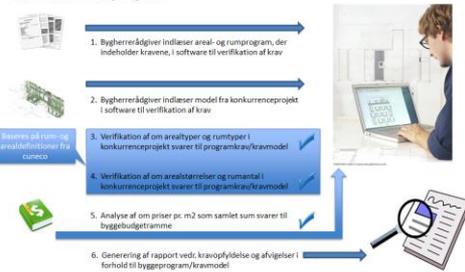
Communication model

User

The user and cuneco talks about how the cuneco standards can be used in the software products

The user and the software company talks about the users wants to be able to do based on the cuneco standards

cuneco

The software company and cuneco talks about how the cuneco standards can be implemented in the software products

Software company

The cuneco server

Apps

Incorporated in software

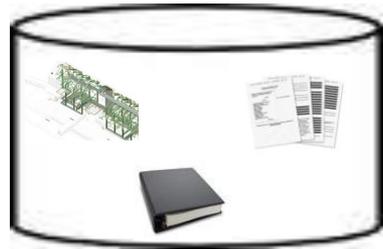| The cuneco server |
|---|
| Classification tables |
| Structure, definition and units for property data |
| Definition and documentation for Information levels |
| Best Practise manuals |
| Documentation |

User interface

Web-services / API's

Contractor recieves digital tendering material as basis for offer

1. The contractor downloads the tendering document, specification and IFC-model from a tendering portal
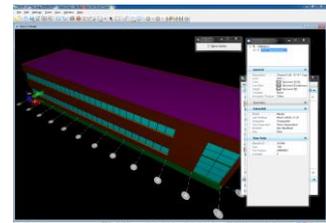
A digital tendering document is defined

2. The bill of quantities is loaded into the calculation software with construction elements and quantities

3. The IFC-model is loaded into a viewer which is connected to the calculation system

A link is established between the bill of quantities and the model

4. When the contractor is working on the calculation objects are highlighted in the viewer when they are selected in the calculation software
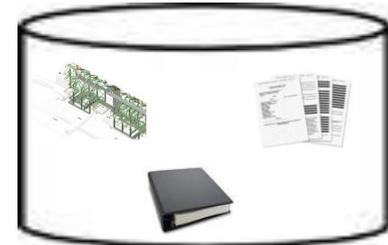
5. Prices are filtered in the database according to property data

Properties are defined for the records in the bill of quantities

6. When the calculation is finished the document is exported including prices to the tendering portal

Ongoing and finished projects

- 10 011 Requirement analysis
- 10 111 Relation between cuneco projects
- 11 011 Structure and syntax for Classification of Results
- 11 061 Conceptual model for Resources
- 11 091 Classification of Construction Spaces
- 11 101 Classification guidelines for Construction Entities
- 11 111 Revision of ISO-standard
- 12 011 Structure for Property Data
- 13 011 Structure for Information Level
- 14 021 Digital tendering document
- 14 031 Data for tendering
- 14 041 Measurement rules
- 15 011 Test project - DNV Gødstrup
- 19 041 Framework for the cuneco Server
- 19 051 Online Concept Catalogue

Experiences so far

- Communicate!
- Establish, use and expand the network – on national and international levels
- Have focus on the small wins
- Focus on describing what the aims are for the projects