The COBIM Project
Savings due to diminished hassle:
- 40% waiting
- 30% moving around
- 30% productive work

Prerequisite for clash detection, analyses and simulations:

Prerequisite for Lean:

Improved quality and productivity:

Visualizations improve communication between project partners and clients/non-professionals.
Senate Properties - Finland's largest property asset manager

Senate Properties is a government owned enterprise responsible for managing and letting the property assets of the Finnish state. The property stock includes university, office, research, cultural and other buildings. Senate Properties mainly lets premises to government bodies.

Senate Properties lets, maintains and develops its property stock on market terms. We aim to be a reliable partner in all property solutions and services.

Our aim is for clients to consider us as a dependable partner and adviser, helping them find a solution to all their property and service needs.
More than 40 projects of which approx 50% where all partners used BIM

- PM4D – Product Modeling 4D 2001-2002
- VIP- Virtual Investment Process 2002-2006
- REBIM – BIM for the Real Estate Business 2006-2008

Senate BIM Requirements 2007
National BIM Requirements 2012

Built Environment Process Re-engineering (PRE)
- workpackage MODEL NOVA 2010-2013
- workpackage NewWow 2010-2013

Concept Design BIM 2010 (CDB-2010) 2009-2011
Nordic Energy Project (NOW - 001) 2010-2011

Sami culture centre
OLH, vt3, PK
LVM
Synergia Medicum
Kuopio tax office
Mikael school
Helsinki Music Hall
Wanha lääni
Lohipato school
Bulevardi 18
MMM
Haka6
Tietotalo2
TTY
Aurora2
VTT
Didacticum
HUT 600

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010

Courtesy: Jukka Riikonen
MODEL NOVA
New Business Model Based on Process Network and Building Information Modeling (BIM)

Auli Karjalainen
MODEL NOVA work package partners

Companies:

Research teams:
Aalto/SimLab & CRADLE

+ ongoing plans exist for collaboration with Stanford University

Courtesy: Auli Karjalainen
Overall objective of the work package

- **Processes and business models** based on BIM and
- an *operating culture* that *provides added value* and *promotes sustainability and responsibility*
- across the *value network*
- as well as throughout the *life-cycle* of the built environment.
5 zeros
“We model all design and building systems; this is a group-level decision,”

Tiina Koppinen
Skanska 2009

“BIM is not only technology: 80% of its implementation is about adopting new ways of working. This year, we will implement energy and carbon analyses, and see how construction safety can be improved through modeling. A model created using Tekla software makes it possible to visualize and check critical connections in terms of safety, for example.”

Tiina Koppinen
Skanska 2009

Courtesy: Janne Lindberg, Tampere
The COBIM project

- Common
- National
- Requirements for
- Building
- Information
- Modelling
COBIM, Objectives

• The objective was to write national requirements (not guidelines)
• All players in the value chain, the whole lifecycle
• can be used as appendices to contracts
• The requirements were to deal with the technical qualities of the model only
• Complicated contract issues such as the ownership of the model and consultant fees were set aside due to a fear that these might delay the project, or even worse, make it to come to a standstill

• NOT Issues concerning ownership and IPRs of the model
• NOT costs/fees for producing BIM
COBIM, Previous guidelines

2004-2005

2007

2010
COBIM, The Baseline

Examples of sources
COBIM

The Partners

**Consulting offices**
Aitta Ltd, a joint development company of 10 architects’ offices
Larkas & Laine, Architects Ltd
SWECO PM Ltd

**Cities**
Helsinki, two different departments, capital of Finland, Finland’s largest city
Espoo, 2nd largest city
Tampere, 3rd largest city
Vantaa, 4th largest city
Kuopio, 8th largest city
# COBIM

## The Partners

### Software Companies
- Future CAD Ltd (Revit, Autocad)
- M.A.D. Ltd, (Archicad)
- Sebicon Ltd (Bentley)
- (Tekla Oyj)

### Construction Companies
- Lemminkäinen Talo Ltd
- NCC Rakennus Ltd
- Skanska Ltd
- SRV Rakennus Ltd
## COBIM

### The Partners

**Clients/Others**
- University of Helsinki, two different departments
- The Joint Authority for the Hospital District of Helsinki and Uusimaa
- HUS, two different departments
- Senate Properties (Senaatti)

**FM**
- ISS Services Ltd
- ISS Proko Ltd

**Others**
- Ministry of the Environment
- building SMART Finland (bSF), approx. 50 members
- The Building Information Foundation RTS (Project Owner)
COBIM

The Partners

The Writers
- Finnmap Consulting Oy
- Gravicon Oy
- Insinööritoimisto Olof Granlund Oy
- Pöyry CM Oy
- Solibri Oy
- Tietoa Finland Oy

- VTT / Skanska Oyj, Lemminkäinen Talo Oy, NCC Rakennus Oy, SRV Rakennus Oy
COBIM

IPR

- Each partner, i.e. financiers (money or in kind), writers and the Building Information Foundation RTS
- receive full, equal and parallel rights to freely, and without asking the permission of others, benefit from the results as they wish
- including the right to change and further develop the results and to extend the rights to others
COBIM Schedule

2010
- START-UP

2011
- KICK OFF
- REVISED
- NEW
- 250 k€+

2012
- READY
1 General Issues
2 Modelling the starting situation
3 Architectural Design
4 MEP Design
5 Structural Design
6 Quality Assurance
7 Quantity Take-off
8 Visualization,
9 MEP Analyses
10 Energy Analysis
11 Management of a BIM project
12 Facility Management
13 Construction
14, Building supervision

Series 1-9 are revised versions of Senaatti’s present guidelines. Series 10-13 are completely new. Series 14 will be written later since it connected to upcoming regulation. A preliminary version is likely to exist by June 2012.
Series 1, General Issues
Tomi Henttinen, Gravicon Ltd:

• Series 1 describes the basic principles, requirements and concepts that should be followed in BIM-based projects.

• It defines the general targets for BIM in projects.

• The BIM Coordinator will apply these targets for the project and supervise the modelling according to these objectives.

• At certain points of the project, such as building permit application or bidding, BIM is a tool for decision making.

• In the everyday routines, the Working Models are intended to be a flexible and rapid method to exchange design information and to present the design solutions.
Series 2, Modelling the starting situation
Marko Rajala, Tietoa Finland Oy:

• Series 2 deals with modelling the existing building and the building site as a source of information for design and construction needs.

• It describes the requirements for measurements and other information that are needed to create inventory models as well as other as-built documentation.

• With reliable and accurate source data, it is easier implement new design to an existing building, and to ensure, that the new systems and appliances can be installed and maintained.
Series 3, Architectural Design

Tomi Henttinen, Gravicon Ltd:

• In the BIM-based design process, the architect’s BIM is mandatory for all the design phases. It is the foundation for all other models and it is an integral part of many analyzes and simulations.

• Series 3 specifies the requirements for the architect’s BIM in various phases of the project.

• These requirements are divided into three levels, but the details need to be adjusted according the different purposes of the models.

• The intended use and accuracy of the model is specified in the Model Description Document each time the model is published.
Series 4, MEP Design
Tero Järvinen, Granlund:

• When building design and construction is realized in accordance with these requirements,
• the MEP systems model will contain basic prerequisites for the utilization of the model in systems for **use and maintenance**, throughout the whole life cycle of the building.

• New issues are e.g.
  • BIM based service area maps,
  • presentation of components, and
  • definition of the detail level for the information content and the geometry for **each design phase**.
Series 5, Structural Design
Tero Kautto, Finnmap Consulting Ltd:

• The viability of structural BIMs is determined by
  • the scope, precision,
  • data richness, and
  • the correct timing of the modelling work.

• The requirements have been broken down into design stages, each stage consisting of a list of BIM tasks and a list of the extent and the accuracy of the modelling work.

• The other project participants have been taken into account
  • in the extent of the model and
  • by requirements for marking up the comprehensiveness of the model.
The viability of BIMs in general depends on the appropriateness and reliability of their contents. The quality assessment part goes into methods by which the BIM contents described in the other parts can be put into a format which is usable and meets the requirements.

Series 6 consists of

- self assessment done by the information producers, mostly designers, before delivering the information to other parties for use as initial information,
- of coordination of information during design, and
- of final check of the information model of certain phases.

The series contains practical guidelines about how to avoid problem issues as well as check lists for each agent for a more profound assessment.
Series 7, Quantity Take-off
Matti Tauriainen, Finnmap Consulting Ltd:

• Series 7 describes essential BIM requirements and guidelines for quantity take-off.

• It is possible for building owners and clients, designers, contractors and product manufacturers to utilize quantity take-off in completely new ways and from new perspectives.

• Measuring quantities manually from drawings is replaced by computer-assisted measurement from a BIM. New competences are required by a quantity surveyor performing BIM-based take-off.

• Quantity take-off puts some requirements on the modelling activity. It should be done according to the design discipline requirements, in a logical and consistent manner to given level of detail, such that the identification of building elements and building system parts is possible.
Visualization can be divided into two main types.

- The first is a traditional photo-like rendering, which describes the designer's vision of the design solutions.
- The second form is a technical illustration. It serves as a communication tool for the design team, client, project management and construction site.

The key advantages of utilizing the BIM-based visualizations are

- quality assurance of the design,
- easy comparison between different design alternatives,
- improved communication and
- support for development and marketing.
Series 9, MEP Analyses
Tero Järvinen, Granlund:

• Series 9 describes possibilities brought into MEP analysis by modelling.

• Pictures with examples of various analyses have been added and

• differences between lighting calculation and lighting analysis have been clarified.
•The importance of energy efficiency management has been emphasized by giving energy analyses a part of their own in the requirements, whereas they earlier were a part of the general MEP analyses.

•Series 10 describes tasks during design and construction that are essential from the viewpoint of management of energy efficiency and indoor climate, as well as commissioning and maintenance phases which are relevant from a result verification viewpoint.

•Utilization of BIMs enables a more systematic and transparent, and in most cases more efficient, means to steer the energy impact of design than can be achieved by traditional methods. However the most important benefit from BIMs is that they make sure that the information used in the calculations is correct.

•The requirements support the implementation of the new Finnish 7/2012 energy regulations. In addition to tasks related to the building permit, requirements are set for utilization of BIM in energy analyses all the way from the early project stages down to the building start-up.
Series 11 Management of a BIM project
Elina Mäkelä, Pöyry CM Ltd:

• Series 11 deals with
  • project management, and
  • utilizing BIM from the client's point of view.

• Information modelling tasks of project management are described as procedures as well as design, implementation and control measures.

• Information modelling tasks are divided into stages according to the General Project Management Task List.

• BIM deliverables and analyses that are used to support decision-making on a project-specific basis have been described at each stage of the project.
Series 12, Facility Management
Tuomas Laine, Granlund:

- Series 12 describes requirements and potential areas for utilization of BIM during the use and maintenance phase of the construction process. It offers illustrative examples of the utilization potential and the benefits of BIM as support for facility services processes.
- It describes the information management process throughout the whole construction value chain, and
- it sets minimum requirements for the update and quality assessment methods of BIMs for the use phase.
- The requirements include IFC based data transfer. Other data transfer standards for the use phase (COBie) are dealt with as well.
- Even if the requirements now set, are modest compared to the utilization potential, this part has an important position since it provides an analysis and paves the way for a growing use of BIM as integral part of the facility services processes.
Series 13, Construction
Markku Kiviniemi, VTT, the Technical Research Centre in Finland
Marjo Peltomäki, Skanska Oyj:

• Series 13 describes
  • BIM requirements emanating from the construction phase,
  • utilization of BIM during the construction phase, and
  • tasks for the contractor to deliver information for the as-built model.

• There is a need to make the models from the design phase available for production planning and coordination.

• The requirements for modelling done by building and MEP contractors are presented as options to be agreed on separately in every project.

• Contractors are to deliver information for the as-built model to the client about adjustments and changes that are agreed on and have taken place during the construction phase.
Series 14, to be written later
Building supervision
Pekka Lukkarinen, Ministry of the Environment
Yleiset tietomallivaatimukset 2012


Julkistustilaisuus Espoon Dipolissa 27.3.2012 klo 13. Ilmoittaudu nyt tästä!

Laaja ohjelman läsittäminen...
COBIM
Where To find?
COBIM

Where To find?
COBIM
How to Use?

RT- ja LVI- File numbers

Version numbers
COBIM
Maintenance and Development
The Building Information Foundation RTS
COBIM
Maintenance and Development

The Building Information Foundation RTS
COBIM

Maintenance and Development

STANDING COMMITTEES

- RTS INFRA
- TALO CONSTRUCTION INFORMATION CLASSIFICATION
- buildingSMART Finland

TASK GROUPS

CUSTOMER SEGMENT COMMITTEES
COBIM
Maintenance and Development

Feed Back to:
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COBIM

Maintenance and Development

Addendums and Updates between Versions

www.buildingsmart.fi
Thank You for your attention

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