How Lean Construction evolves with BIM and Data management

Presenter: Pål Janson, Tomas Lindgren & Claus Vemgaard

Symetri

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About the speakers

- Tomas Lindgren

- Claus Vemgaard

- Pål Janson

We all work with clients who are utilizing the power of BIM as in managing models and data in one context to get the maximum benefits of BIM

+ 300 EMPLOYEES
+ 100.000 USERS

SYMETRI
ADDNODE GROUP

We challenge people
to **work smarter**
for a better future

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Today's topic

How Lean Construction evolves with BIM and Data management

Agenda

LEAN

UNBROKEN
INFORMATION FLOW

No rework! – Recycle
produced material!

SOLUTIONS

A STANDARDIZED WAY
OF WORK

BIM - Data integration
between different systems.

PROCESS

THE FIVE W:S

Who is doing it?
What should be done?
Where should it be done?
When shall it take place?
Why is it done?

CHALLENGES

ACKNOWLEDGE THE
CHALLENGES

More!
Better!
Less!

Background

Sweden has a need for 710.000 new homes (2015 – 2025).
The current production rate is peaking at appx. 65.000 in 2017
with at prognosis for appx. 60.000 homes in 2018.

- Between1993 - 2014 the production rate has varied between 11.500 – 30.000 homes/year.

- The Nordic countries have a long tradition of prefabricating quality homes in an industrial way.

- Single-family homes dominated this industry in the past. Now there is a high focus on shifting to apartment buildings.

- At the same time the need for public services functions are higher than ever adding to the need.

Challenges

FINANCIAL AND POLITICAL STRUCTURES SETS THE RULES.

High degree of governmental control through building codes, government loans, financial- and rental restrictions etc. "Lowest interests rates ever" makes prices peak. => "Is this the beginning of a finical crises?"

=> COST MUST COME DOWN

DENSIFYING – MORE OF LESS

Many communities are densifying their cities to take advantage of existing infrastructure. This sometimes mean deconstruction of old buildings adding on to the already high demands for new homes.

=> MORE HOMES / M^2 GROUND AREA & FLEXIBLE DESIGNS AND SOLUTIONS TO MEET VARIOUS NEEDS
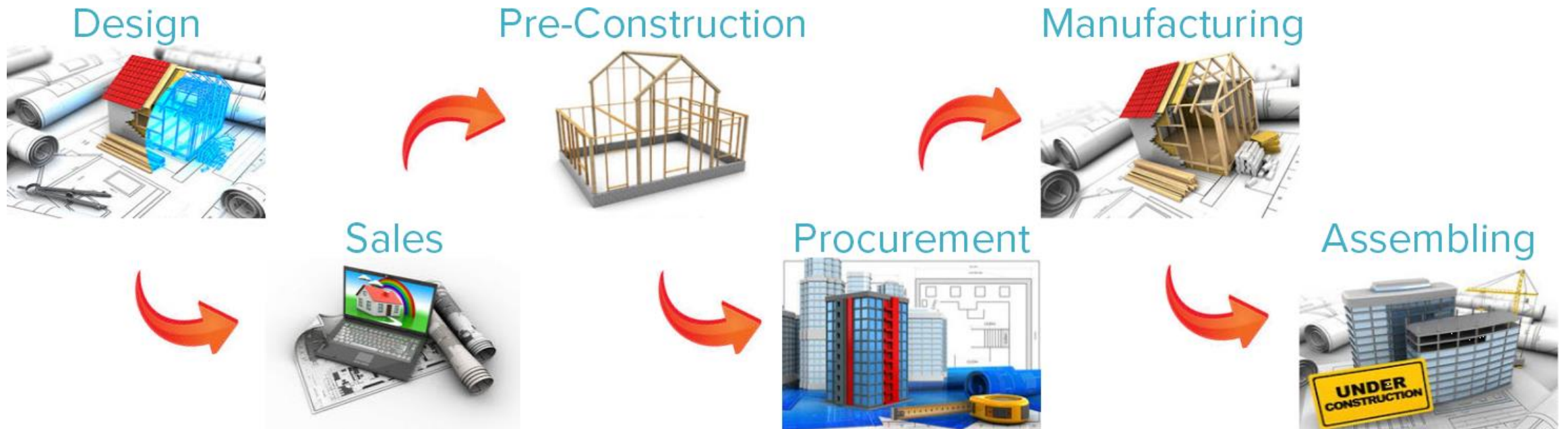
AGEING CONSTRUCTION INDUSTRY

The Construction Industry predicts that 75 – 100.000 people needs to be replaced due to retirements until 2025.

=> WE NEED TO WORK SMARTER

How to tackle this?

FOCUS ON THE PROCESS

Design → Sales → Pre-Construction → Procurement → Manufacturing → Assembling

FOCUS ON THE PROCESSES

EXPLORE THE MAIN- AND SUPPORTING SUB-PROCESSES TO UNDERSTAND THE INFORMATION NEED AT EVERY GIVEN MOMENT

- Setting milestones – Internal deliveries, What?, Who?, When?, How?, Why?
- For who are you doing what and why?
- Is somebody else doing the same thing?
- What can technology do for me?

NO REWORK! – RECYCLE PRODUCED MATERIAL

STANDARDIZE & AUTOMATE

PEOPLES WORK

PROCESSES – NOT SO MUCH PRODUCTS

By standardizing the PROCESSES and way of working a controlled flow of material, data and information are developed and coordinated for each step and all the necessary information is presented at the right time and place.

TECHNICAL DETAILS AND SOLUTIONS

By standardizing Technical Details and Solutions gives greater freedom in overall design and the ability to meet up with different markets/clients needs.

TECHNOLOGY

TECHNICAL PLATFORM AND TOOLS

By utilizing standardized technology platforms and design tools in the form of established products to their full capacity, one can minimize the need for customized solutions.

OUTPUTS AND INPUTS

By designing standardized forms for outputs and inputs little or no time is needed to initiate reports and publishing of design data and drawings.
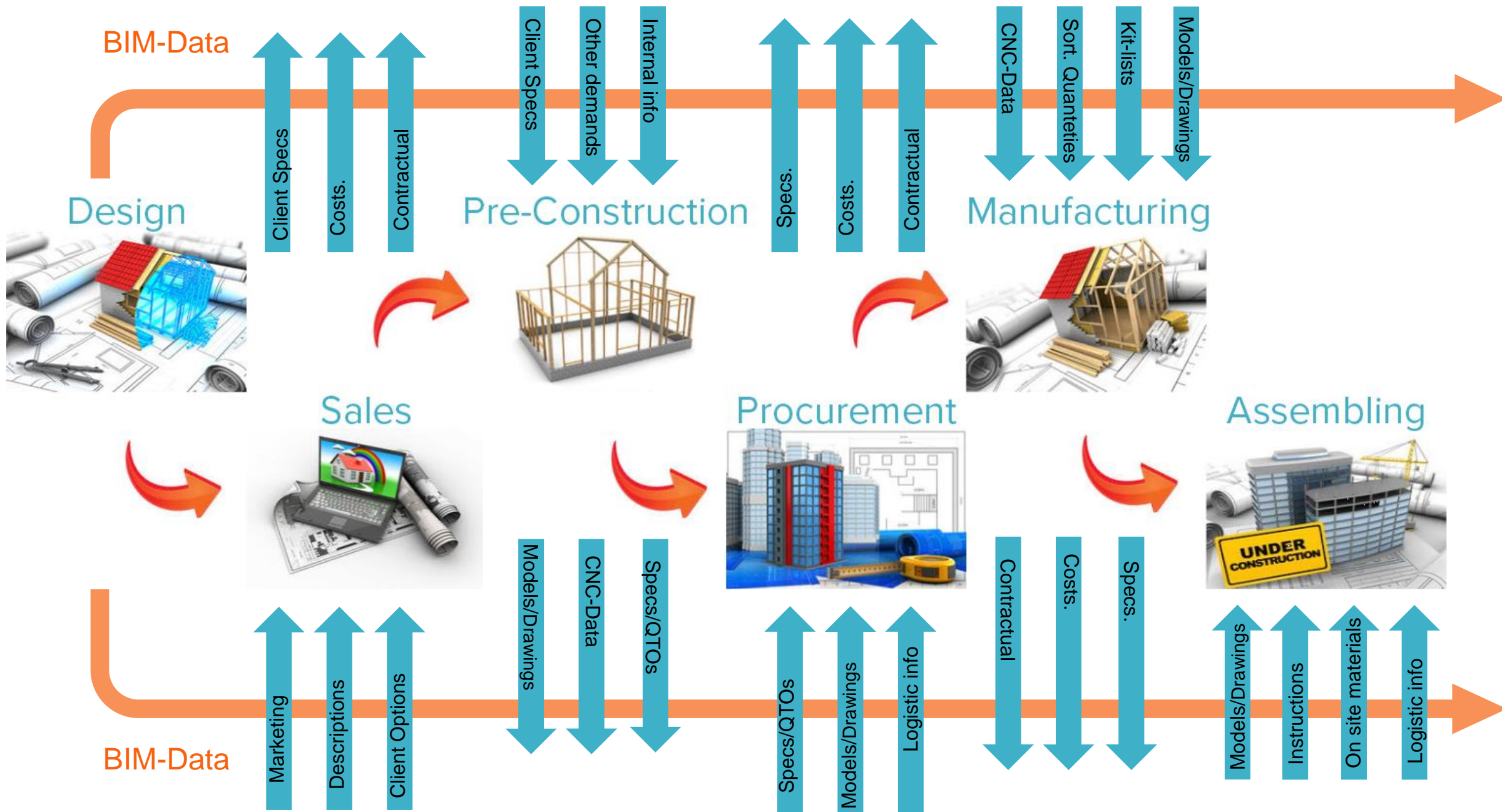
REPETITIVE TASKS

Minimize reoccurring and repetitive tasks through automation

EXPORTS AND IMPORTS

By defining standardising export/import formats and links to related systems, work can be minimized and sources of error can be eliminated.

BIM-Data

Design · Pre-Construction · Manufacturing

Client Specs · Costs. · Contractual

Client Specs · Other demands · Internal info

Specs. · Costs. · Contractual

CNC-Data · Sort. Quanteties · Kit-lists · Models/Drawings

Sales · Procurement · Assembling

Marketing · Descriptions · Client Options

Models/Drawings · CNC-Data · Specs/QTOs

Specs/QTOs · Models/Drawings · Logistic info

Contractual · Costs. · Specs.

Models/Drawings · Instructions · On site materials · Logistic info

BIM-Data

Develop and reuse information over time

Solutions in the main process

STANDARDIZING THE TECHNICAL PLATFORM

Solution must support BIM-processes.

No silos of information

Product to bring down cost/time for development, maintenance and training,

Align with / support clients other system, MS Office, Sharepoint, ERP etc,

production systems etc.

Design and coordination

AEC Collection / Building Design Suite

- Revit (Occasionally Revit LT in Sales) with Naviate / MWF
- Revit Live (Success!)
- Autodesk Rendering
- Navisworks / BIM 360 Glue
- Robot Structural Analysis
- Dynamo
- AutoCAD + 3d party applications (avoid)

Other

- Lumion® (for Visualization)
- Solibri®
- Bluebeam®
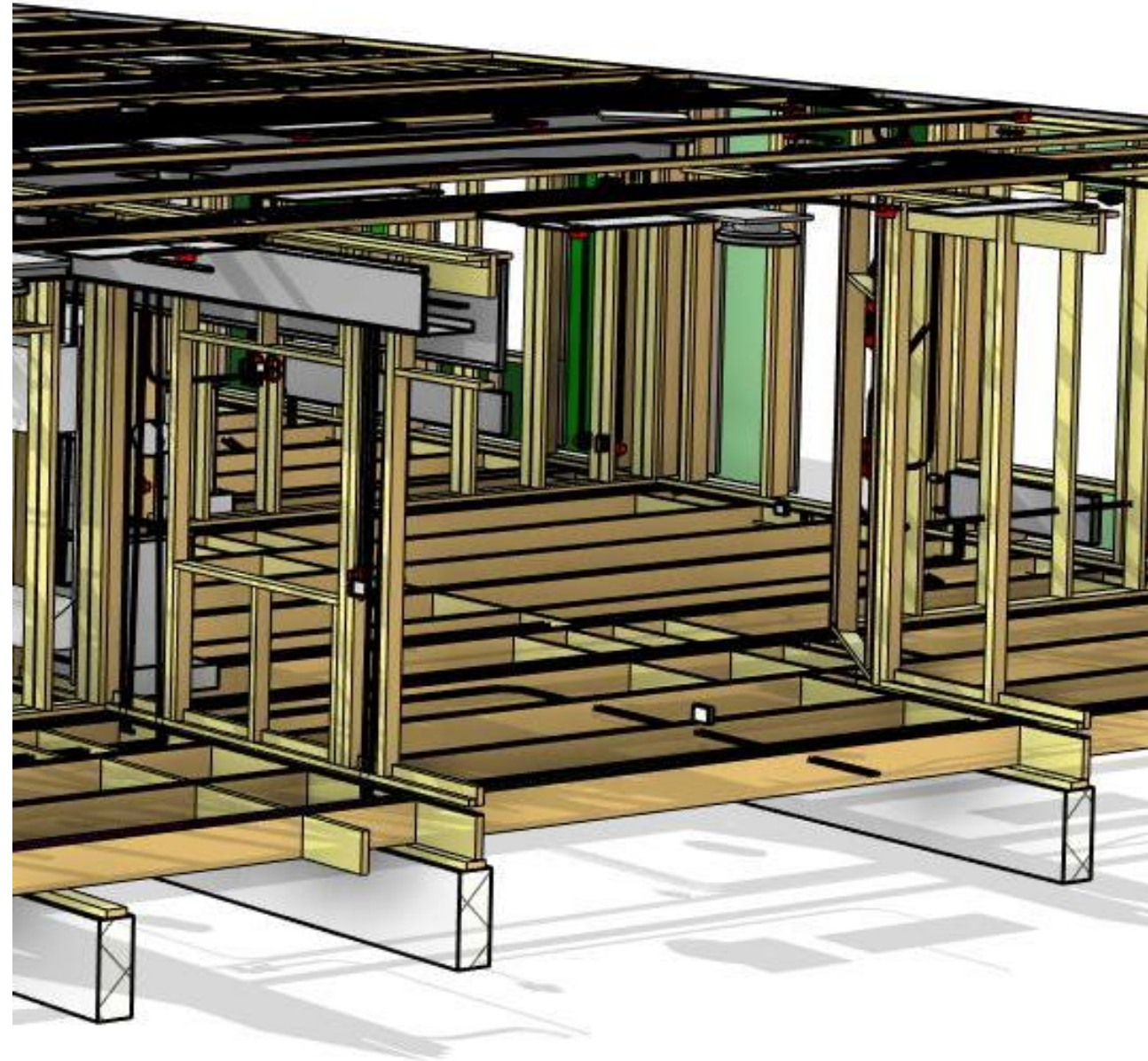
Naviate

Naviate from Symetri is the ultimate Revit add-on for architects and engineers. Your co-pilot on the route towards BIM and IFC

- Full support for collaboration in BIM
- Provides optimal working methodology and a smooth Workflow
- Localized project templates for both new and renovation projects as well as for management of site coordinates
- Supports national building code systems
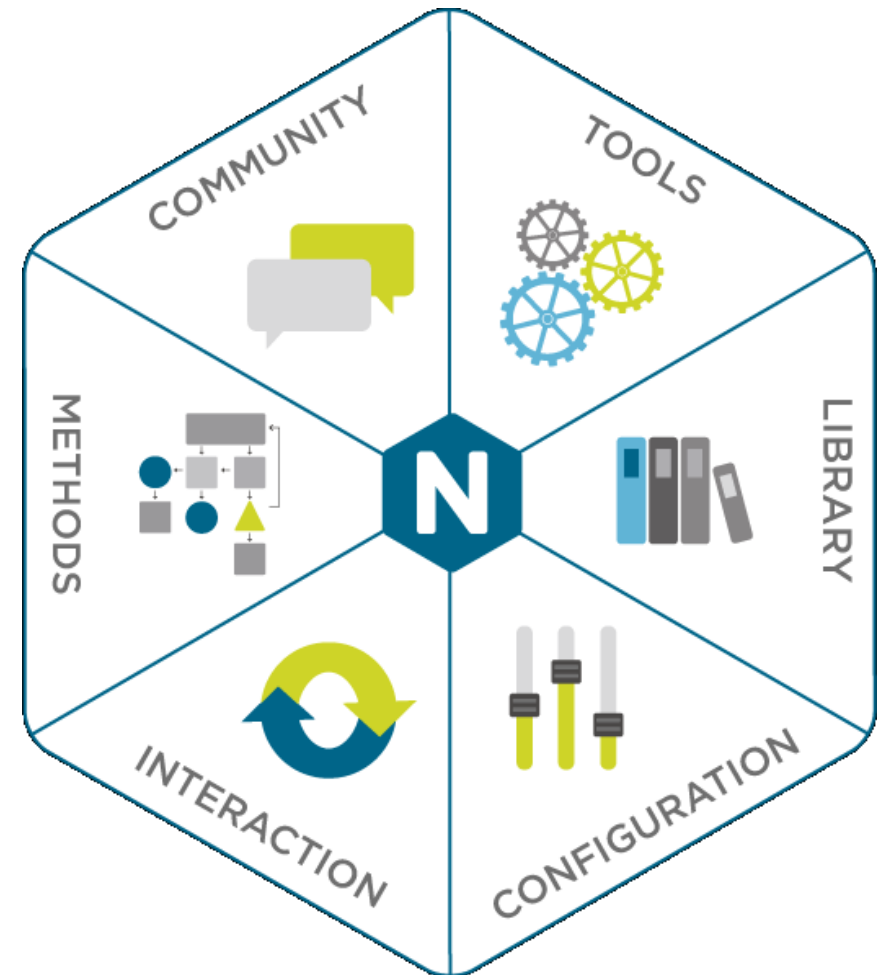
MWF

MWF (Metal Wood Framing) from StrucSoft Solutions is the ultimate framing Revit add-on. Home builders can when using fully leverage the power of Revit.

- Virtually infinite wall framing configurations are made possible with MWF. Create material schedules, cut list, CNC output and dimensioned drawings with a single click.

- Multilayer Wall feature can accommodate multiple sheathing, furring and structural layers of walls adhering to green building standards of Scandinavia, Europe and North America.

BIMeye CDE

- Developed by Symetri

- CDE = Common Data Environment
      - a central repository where construction
        project information data is housed

- Manage the "i" in BIM

- Compare to a project portal for files

- Sync data bi-directional to & from design systems:
  - Addins for Revit, IFC, Tekla and ArchiCAD

- Browser: Accessible for everyone and from
  anywhere

- Not only model-data:
  Add, manage and refine and consume information

- Support for user-roles and rights

- Different apps in BIMeye
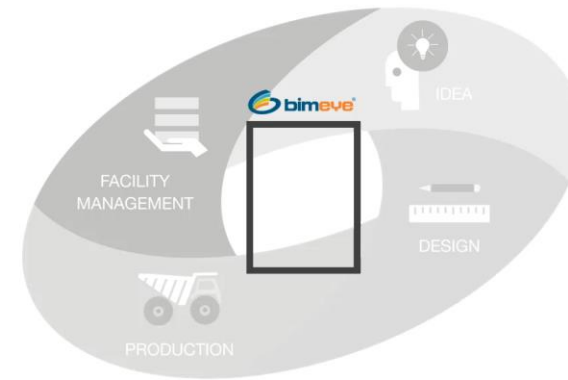
Autodesk BIM360

BIM 360 Design and Docs are the preferred/recomended platform for model- and document management based on the ability to provide a consistent and scalable workflow.

- BIM 360 Design for design and coordination
- BIM 360 Docs for Document management
- BIM 360 Glue for model coordination.
- BIM 360 Field for QC, Issue-reporting, etc.

Client own systems:

- Sharepoint
- Local fileservers (less and less)
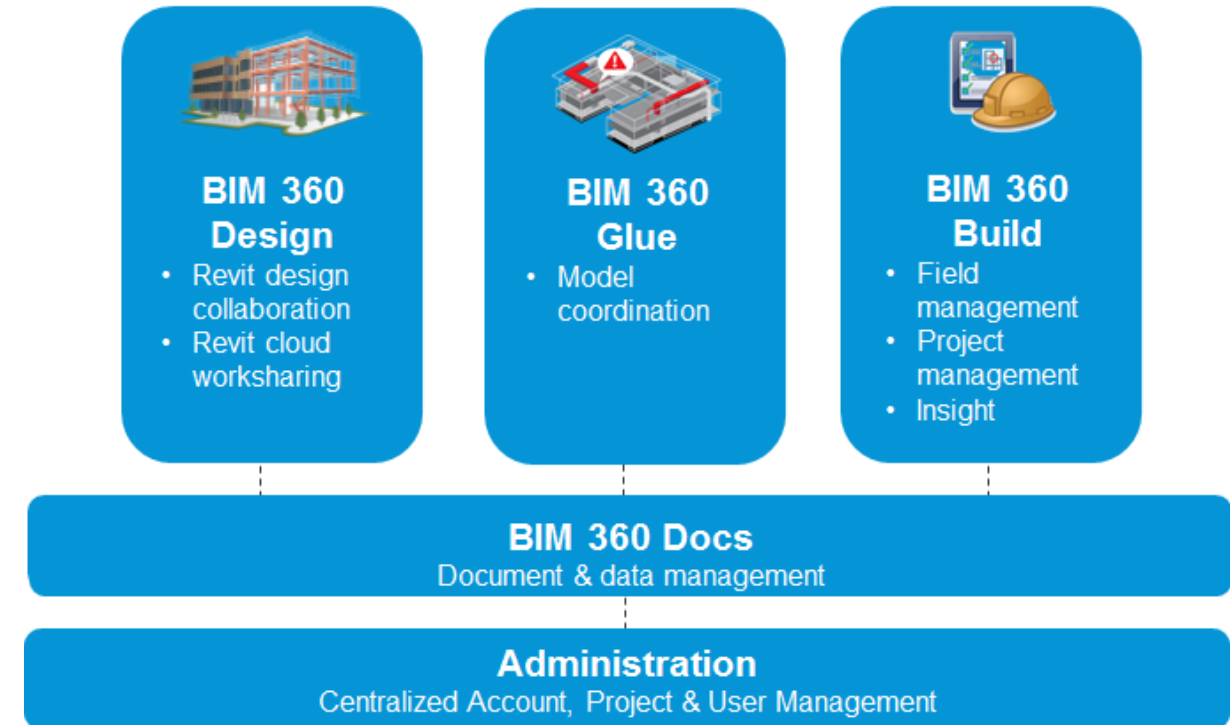
Design and
In project Communication

Mess or structure ?

Communicate data in files or with integrated databases ?

Project setup already from early phases

- BIMeye for BIM **data** management

- BIM360 Design for **model** collaboration

- BIM360 Docs for **document** management

- Several systems integrated

- No (or at least few) files to be communicated
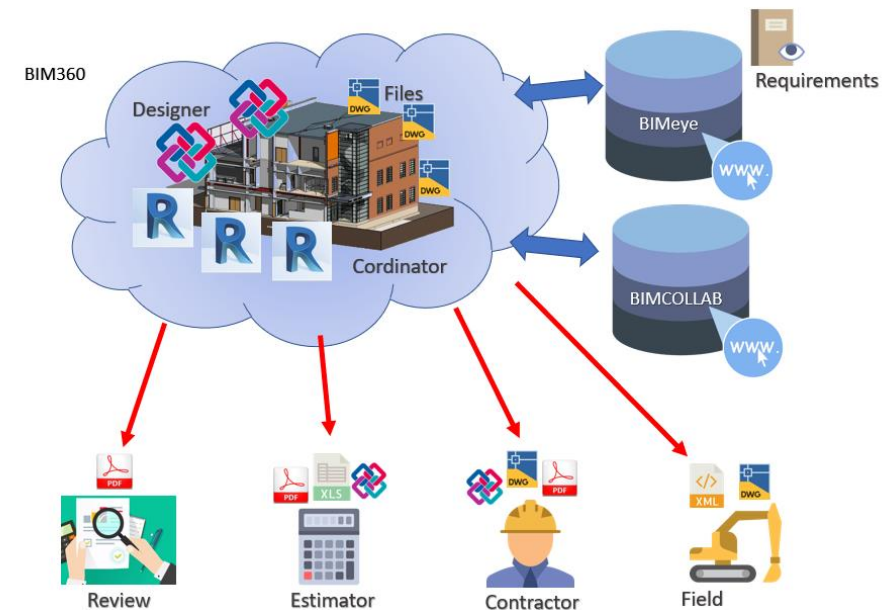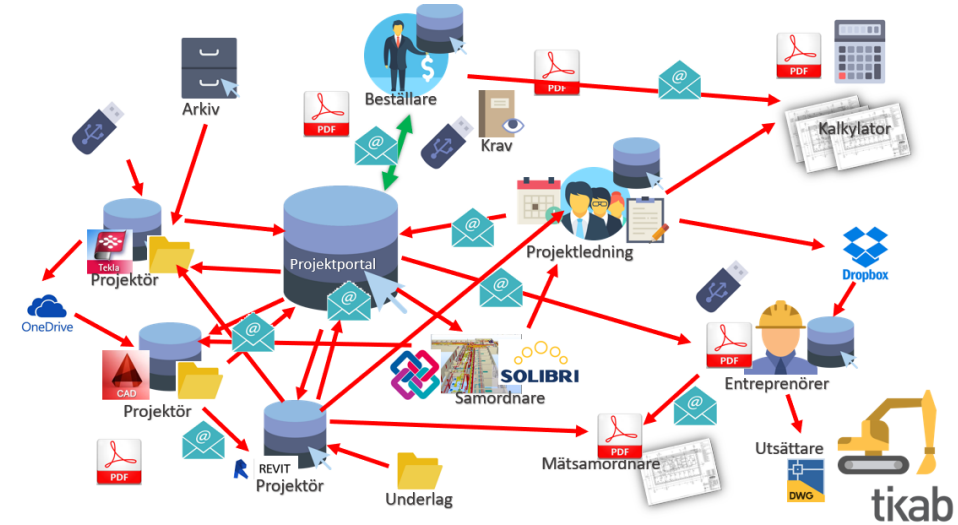
Sales (and why is it important)

Demands:

- Financial regulation/ Banks demands self-financing to get loans. (Risk management)

- Clients are being more aware of costs vs quality and standards.

- "Investment of their life"

Grönbo

- Small company

- Niche - "Ecological Construction" - Products and methods

- New technology – BIM, VR/AR

First project using Revit Live -sold out in 4 days!

New contract for 450 apartments as a result of proven ability to design, produce and SELL the project

Courtesy of Tengbom Architects

Pre-Construction

Completing the design model with framing. This is achieved with MWF. This leads to a seamless pre-construction process where the design model is read and framing is created based on the geometry and the pre-configured framing rules.

- Rule-based framing
- Geometry based
- 100% Revit compatible
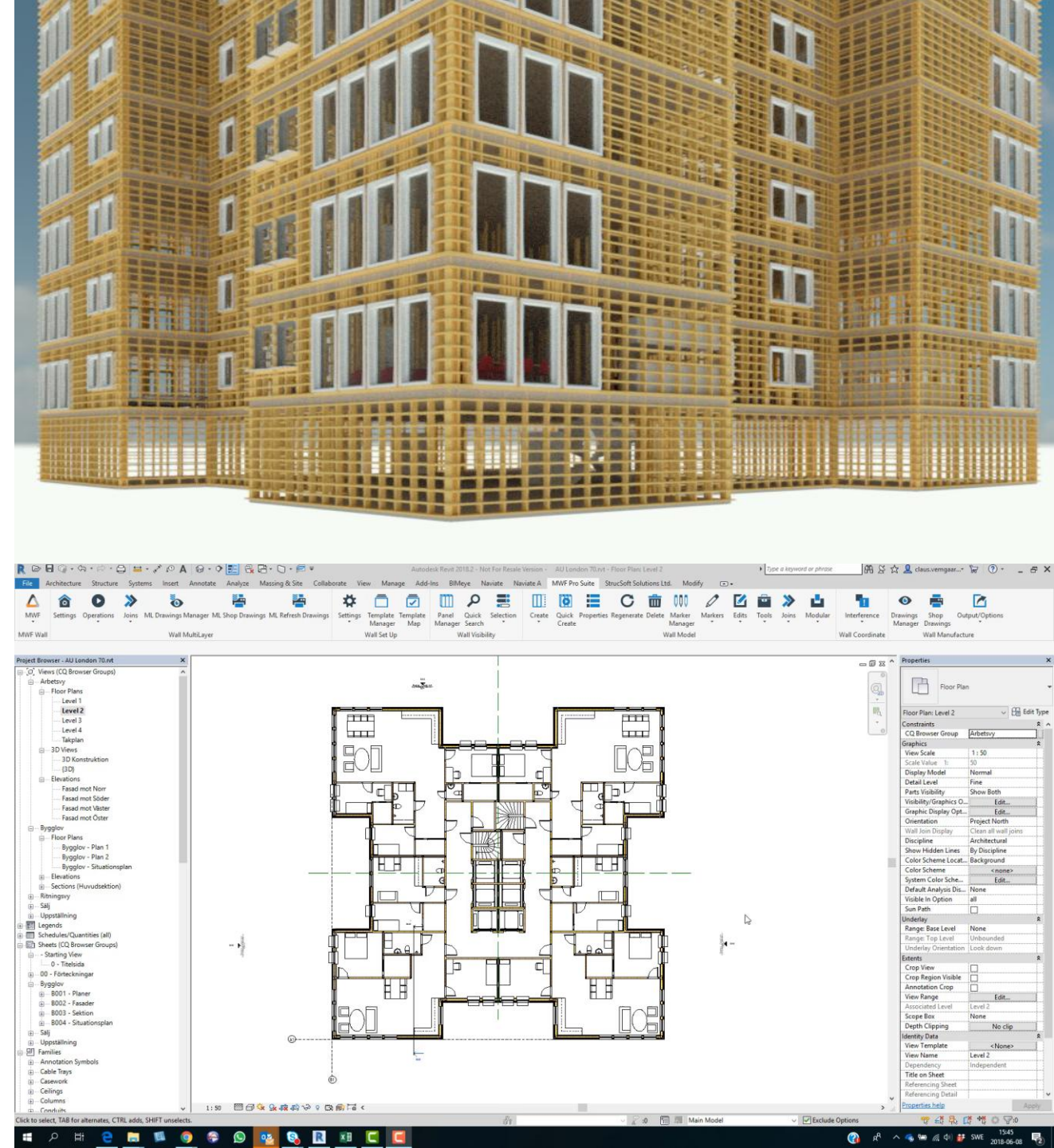
Procurement

BIMeye CDE is used to streamline the procurment process.

Example:

- Products imported to BIMeye CDE
    - Product data
    - Assembly instructions
    - Environment classification
    - Operation and maintenance documentation
- BIMobject & GTIN
- Standard reports created
- Template configuration used by design team
- Correct products chosen already in design phase
- Correct quantities from BIMeye integrated to ERP for purchasing
- As built for handover to FM
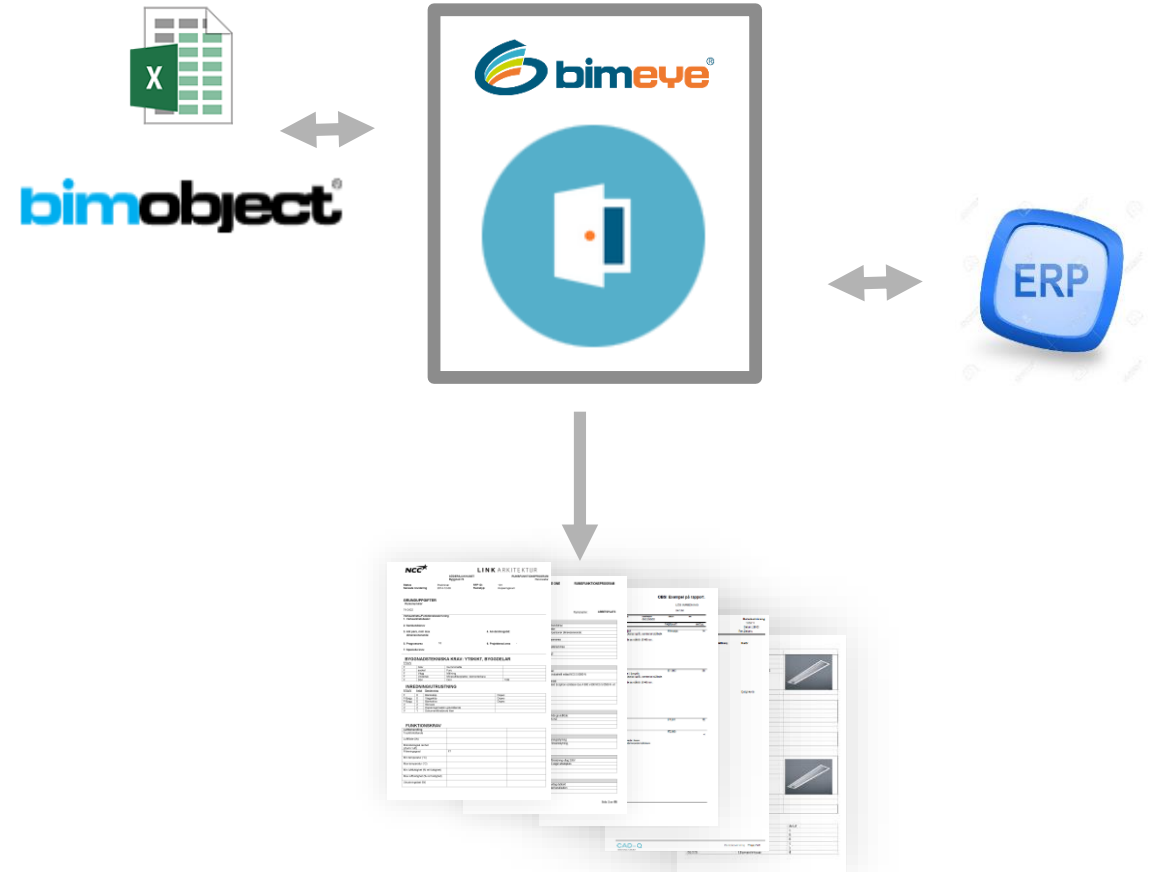
Manufacturing

Delivering appropriate information to manufacturing is key. In most cases, this means shop drawings and CNC data.

The Shop drawing functionality within MWF allows you to create multiple views and multiple sheets. Automatically dimensioning and labelling.

Naviate CNC Exporter introduces a brand new way of CNC-output creation. Through geometrical analysis, the software extracts the data needed for the output. No matter how you create the cuts, holes, millings, drillings etc.
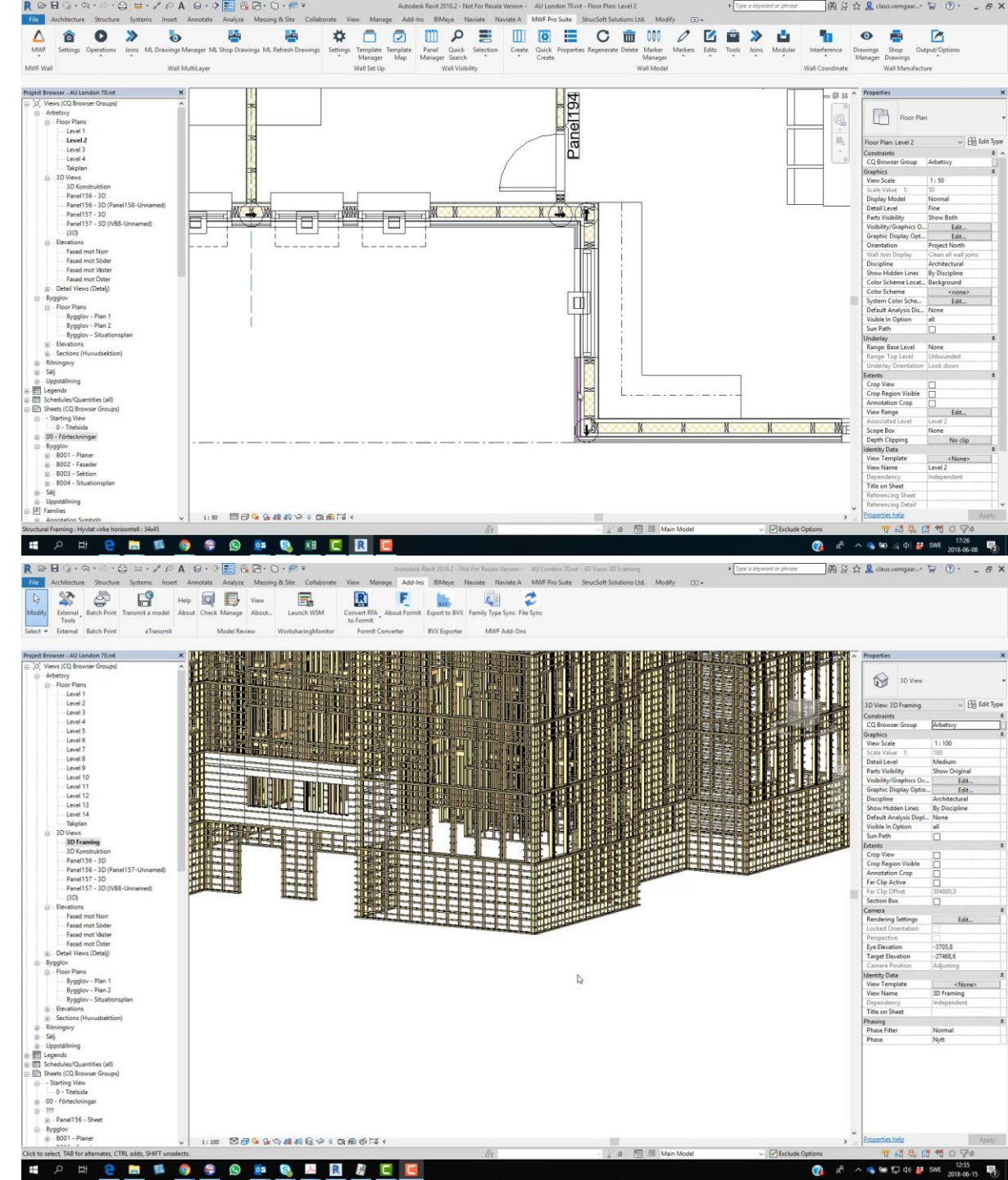
Wrap up

WORK ON THE PROCESSES

To continuous work to improve the processes is the key factor to go from Lean to Leaner. Workflow and People are the most critical aspects.

STANDARDIZE AND SIMPLIFY

Aim for "One Way of Working" gives flexibility with regards to the outcome but keeps down time and increases quality.

CDE FOR INFORMATION FLOW

To achieve an uninterrupted flow of information we always base the data-management process on CDE-solutions such as BIMeye and BIM360. By avoiding data being managed and collaborated in files we can solve that.

AUTOMATE

Using Dynamo and rule-based software MWF giving us multiple benefits.
Automation of time-consuming tasks.
Consistency in modelling and shop-drawing design.
Corporate standard solutions easily applied to multiple projects.

Please meet us in stand number QS 010

Image caption goes here

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Make anything.