Interoperability in the construction industry

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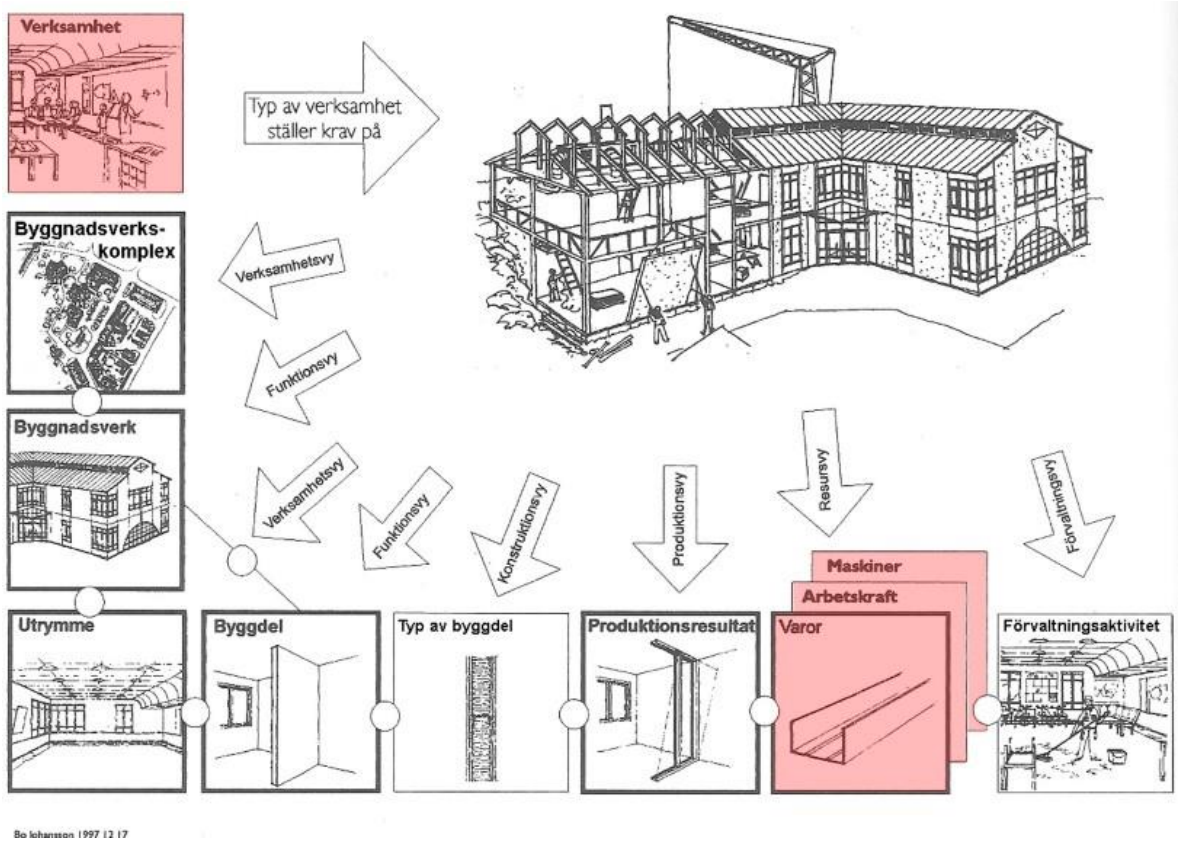
Background

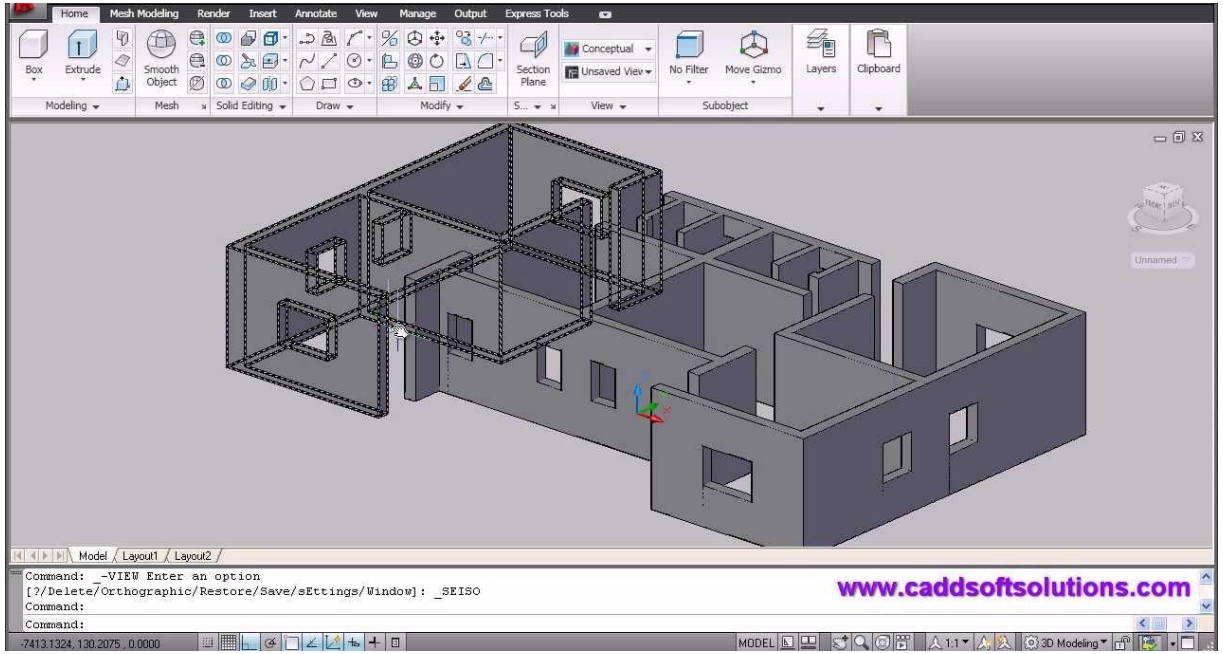
- **Classification:**
  - Construction projects tend to always be setup as temporary. With project members from many companies and different stakeholders and project owner all the time.
  - Develop a common classification
  - Nationbased
  - Since 1930 in Sweden
  - **BSAB**



Background

COVERED PATIO
DINING ROOM
LIVING ROOM
MASTER BEDROOM
PANTRY
ENTRY
COUNTRY KITCHEN
GARDEN
B.R. #2
B.R. #3
LAUNDRY

Background



Autodesk AutoCAD Revit Architecture DesignCAD 3D MAX
TurboCAD PROFESSIONAL NEMETSCHEK BUILDING THE FUTURE AllyCAD BENTLEY MicroStation
SmartDraw CMS IntelliCAD DataCAD SolidWorks
Caddie CorelDRAW GRAPHICS SUITE GRAPHISOFT ARCHICAD FastCAD
DeltaCAD TurboCAD MicroGDS VariCAD IntelliCAD
SketchUp ZWCAD™ SOLID EDGE traceparts

Open model format for interoperability

- *IFC (Industry Foundation Classes) is an open and standardized data model intended to enable **interoperability** between building information modeling software applications in the AEC/FM industry.*

buildingSMART
International Alliance for Interoperability

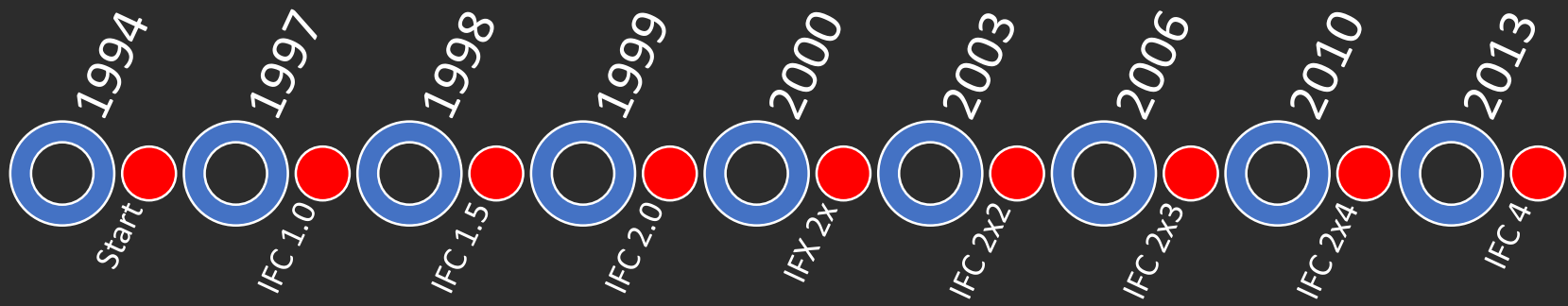
OPEN BIM™

IFC and BuildingSMART

- Official International Standard ISO 16739-1:2018.
- Started 1994 by software company Autodesk and 12 other companies that form a consortium called ´***International Alliance for Interoperability (IAI)***´
- IAI is now called ´***buildingSMART***´ and is developing the IFC-standard.
- ***BuildingSMART*** aims to improve the exchange of information between software applications used in the construction industry

Open model format: IFC

- Short timeline



IFC

- 3D-softwares export to IFC-model and automatically classifies/map the objects to IFC-classes.

IFC TREE-VIEW - The IFC tree structure

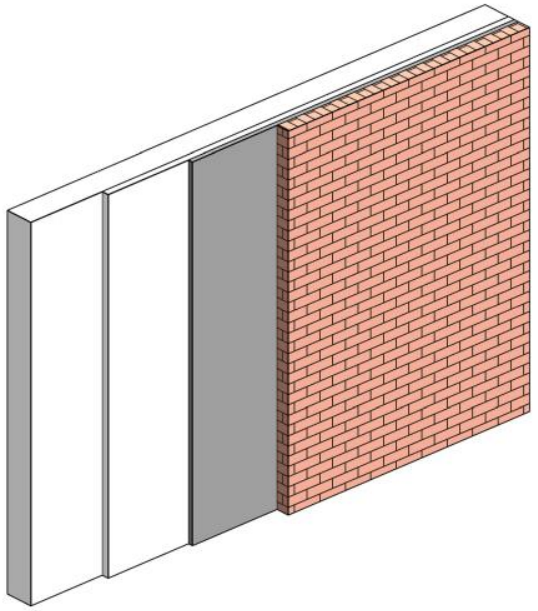
IFC PROJECT
Project
IFC SITE
Property
IFC BUILDING
Building
IFC BUILDINGSTOREY
Floor
IFC BUILDING ELEMENTS
Objects according to IFC classes

CLASS ALLOCATION
What am I?

TYPE DEFINITION
More accurate allocation

INTERACTION
Which objects can I affect?

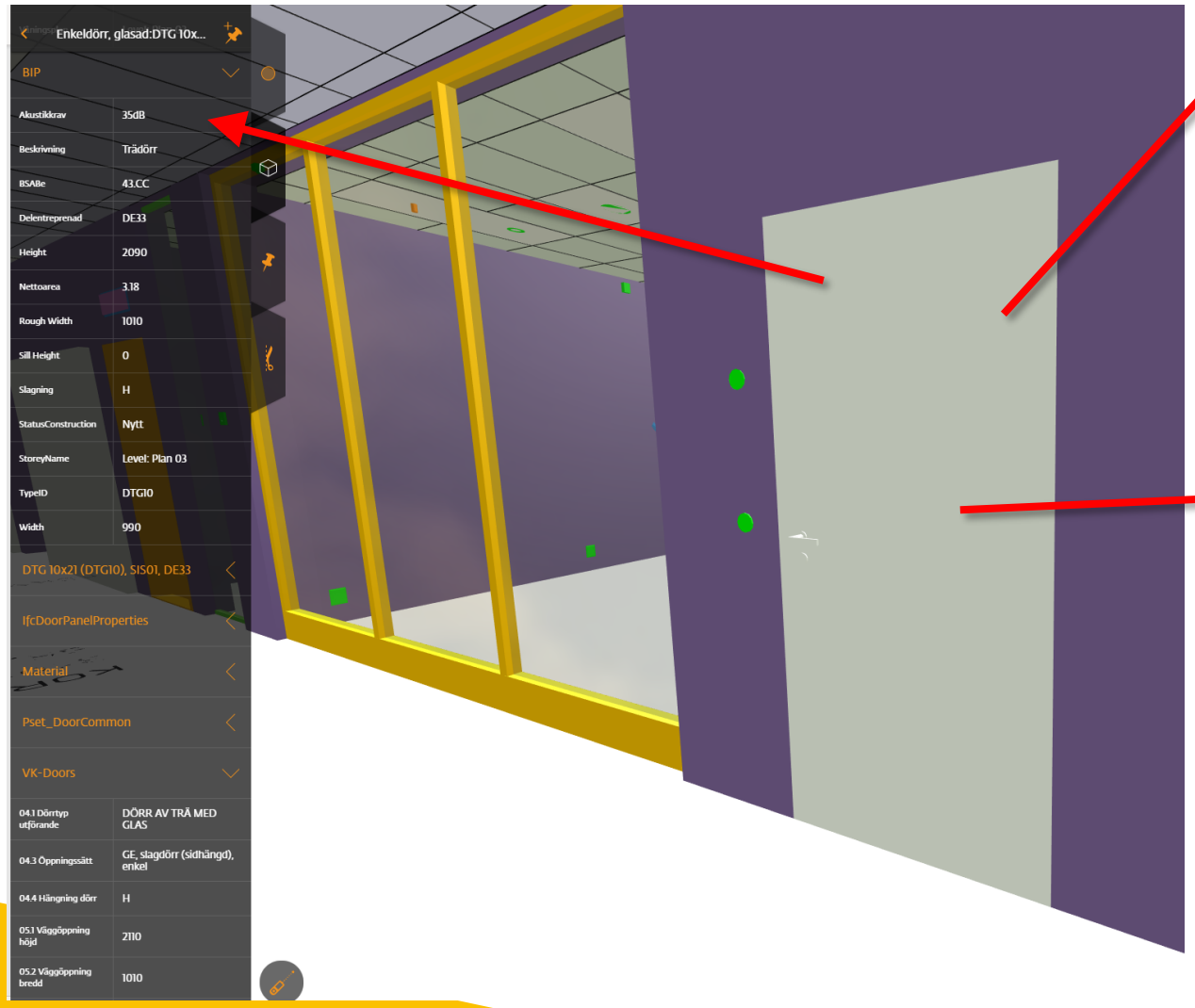
GEOMETRY
What are my measures?



RELATIONSHIPS
What objects are superior or inferior to me?

STANDARD ATTRIBUTES
What information do I generally provide?

Properties



IFC Property Definitions Door:
FireRating
AcousticRating
SecurityRating
FireExit
Material
…

Custom Property Definitions Door:
Manufacturer
ModelNumber
WarrantyStartDate
WarrantyGuarantorParts
WarrantyDurationParts
ExpectedLife
…

Properties information standards and classification standards

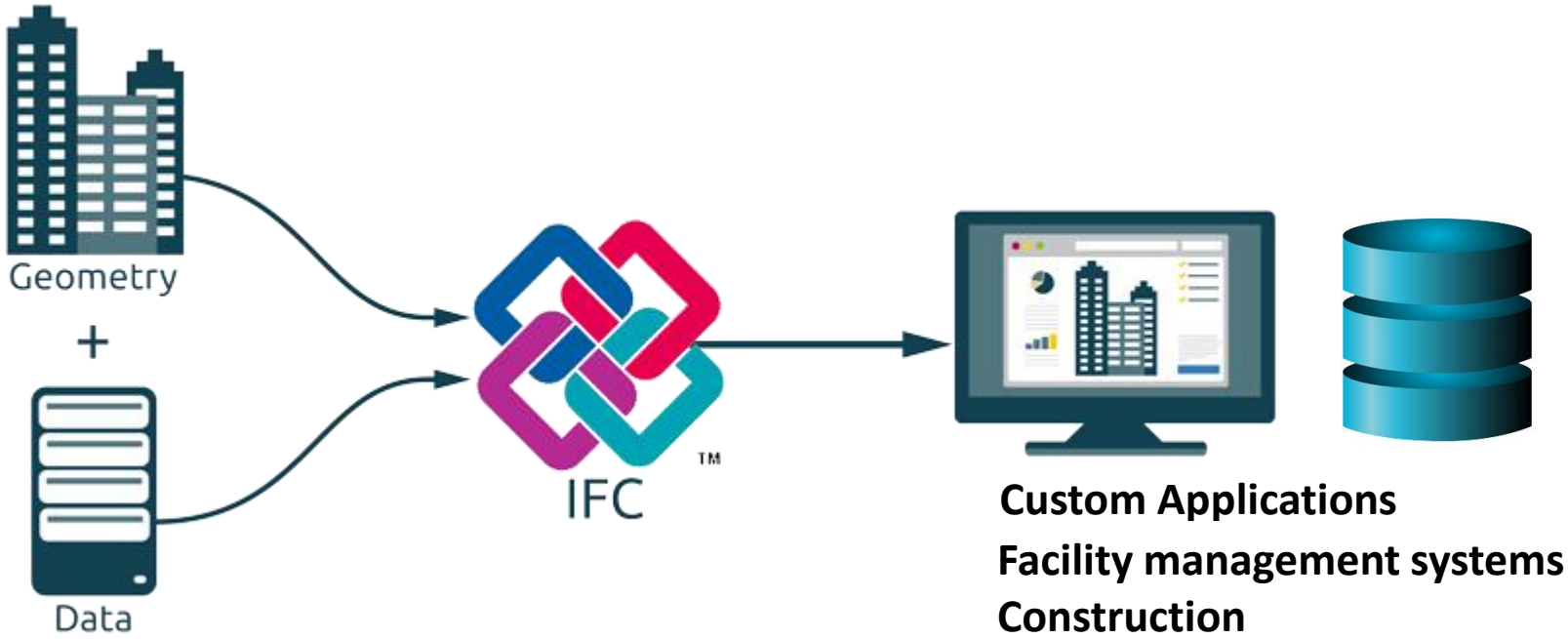
- IFC is required in almost all public projects.
- UK, Norway, Finland, Denmark has Nationbased standards

NBS Uniclass2015 CCS COBie

- Sweden industry standards

CoClass BIP TypeCode

Lifecycle

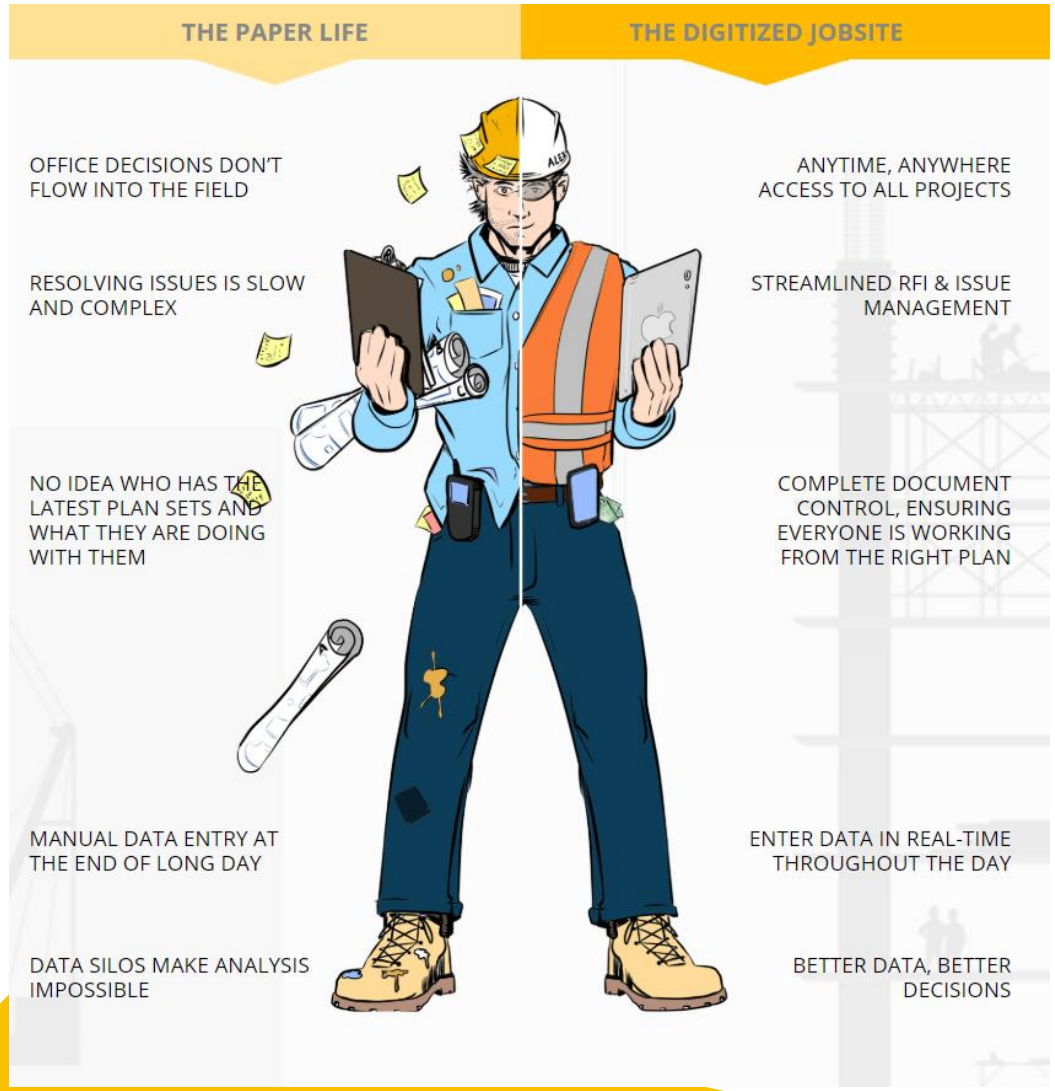

Geometry
+
Data
IFC
Custom Applications
Facility management systems
Construction
Analysis
Estimation
Etc…
Design/Planning
IFC or API, Database. etc

Sharing-interoperability

IFC®

BIM Alliance 2018

How we use it today..



Ditch the paper!

- **Estimation**
- **Planning**
- **Coordination**

- **Construction**
- **As-built check**

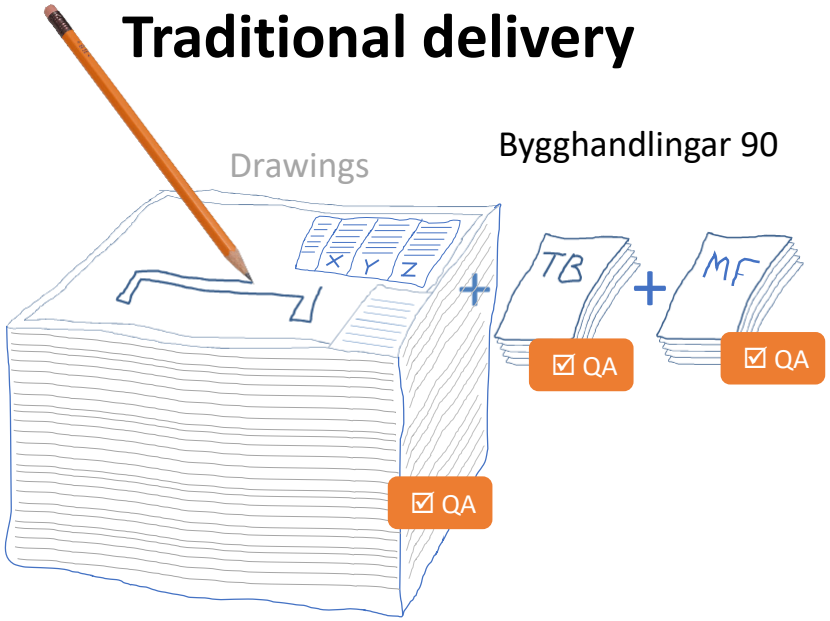
- **Facility management**

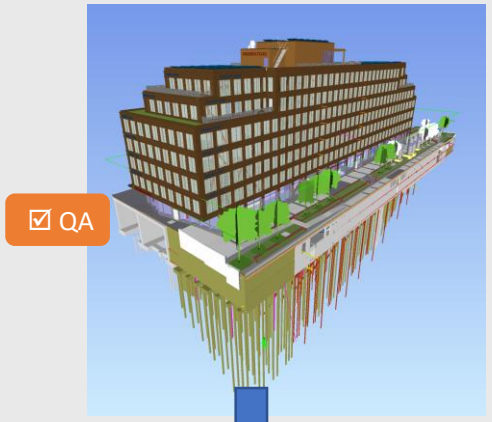
SOLIBRI
A NEMETSCHEK COMPANY

New mindset

DWG

Traditional delivery





Model based delivery

~~Bygghandlingar 90~~

☑ QA Quantity Take Off

☑ QA Models - IFC

☑ QA Technical Documents

☑ QA Measurement models

Thank you!

Johannes Ris

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