

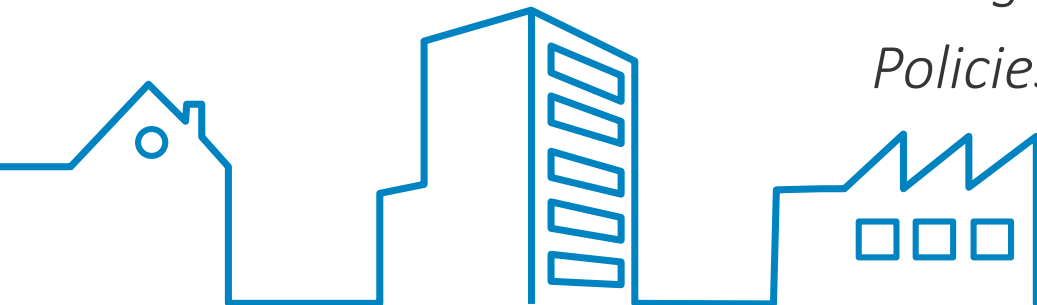


BIM for HVAC Systems


REHVA Seminar

Smart Building & digitalisation in the new EPBD.

Policies and implementation in practice



Frankfurt, March 20th 2018

- 
1. The concepts of BIM
 2. Complexity of today's situation
 3. The future

01. The concepts of BIM

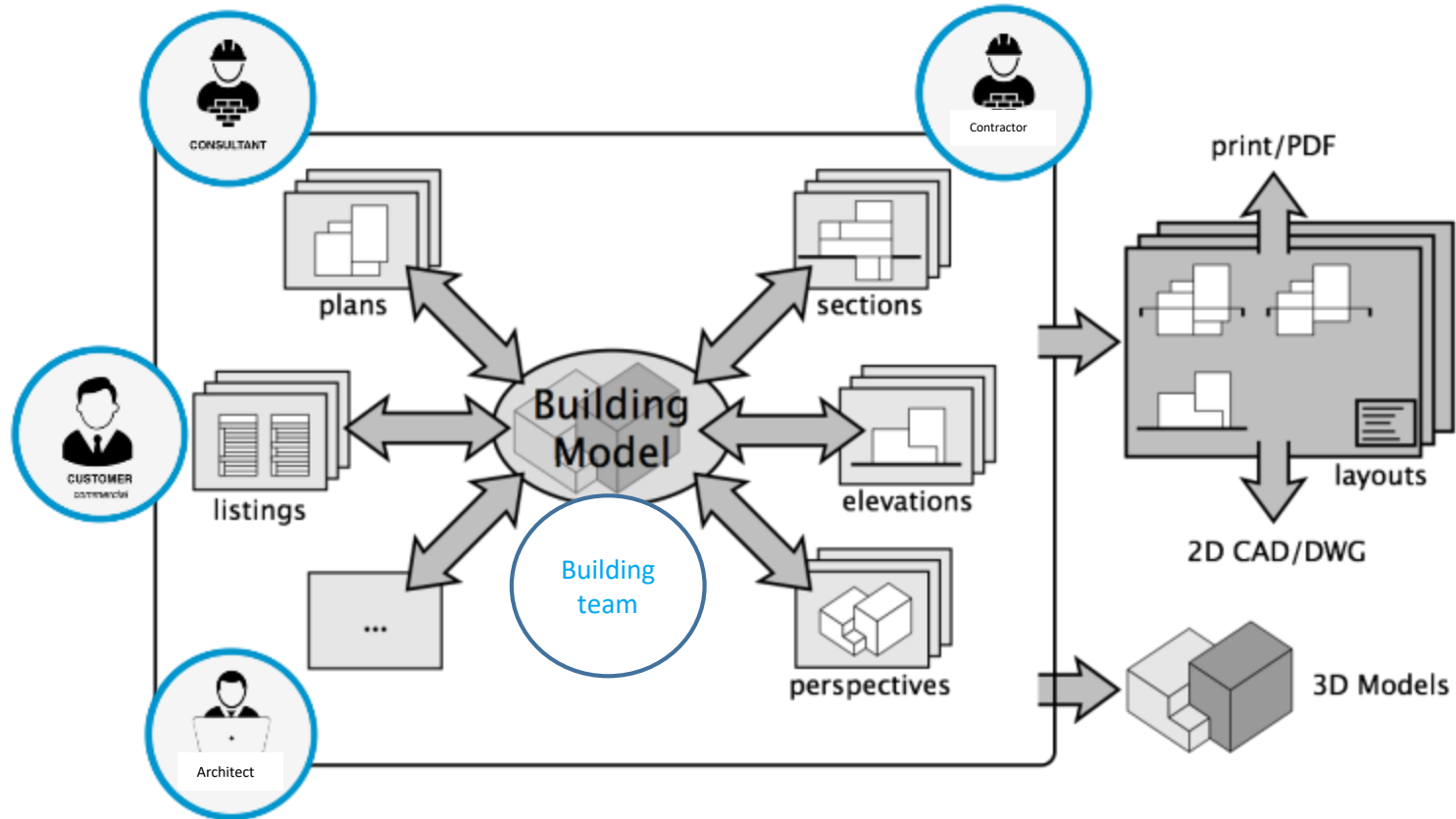
Building Information Modelling

General introduction

1. Building Information Modelling (BIM) is a **process** in which all the **information** and **characteristics** regarding a **development** of a building are **recorded** in a **standardised** manner to create a **digital representation**.
2. Because all **building elements** are **intelligent** and aware of their **dimensions** and other **specifications** such as materials, **clashes** between items are **readily identified** avoiding substantial **costs and delays**.
3. Whilst BIM is a process, not a piece of computer software per se, because of the **volume of data** that needs to be collected and the **necessity to share** with **all participants** it does require software support



BIM = collaboration



BIM Characteristics

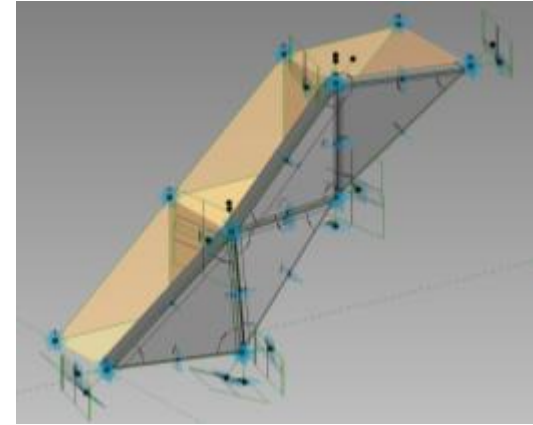
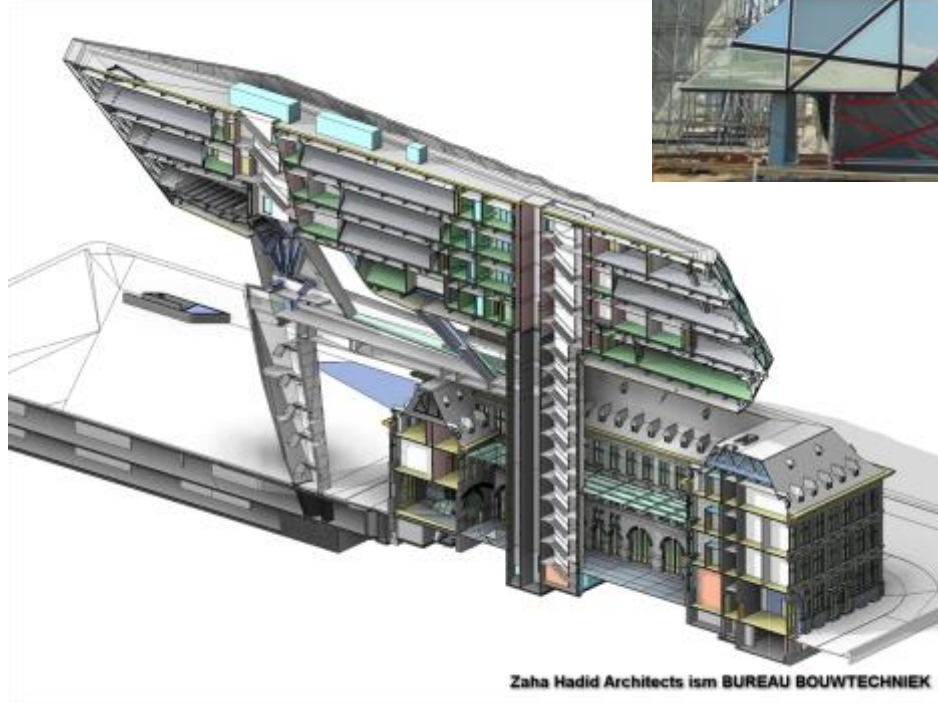
Benefits

- Visualisation
- Issue Finding & Tracking
- Implementing changes
- Pricing & Quantities

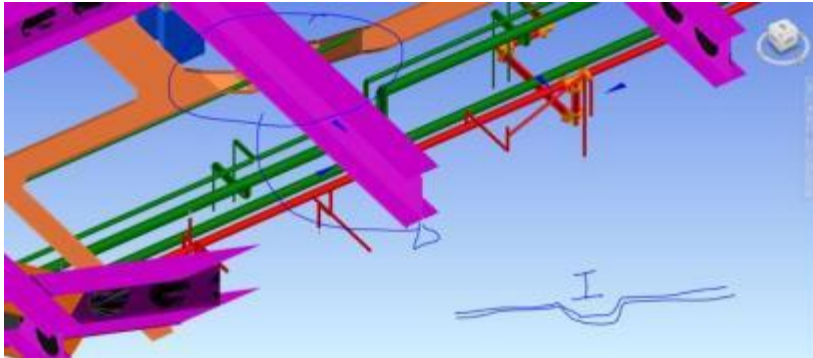
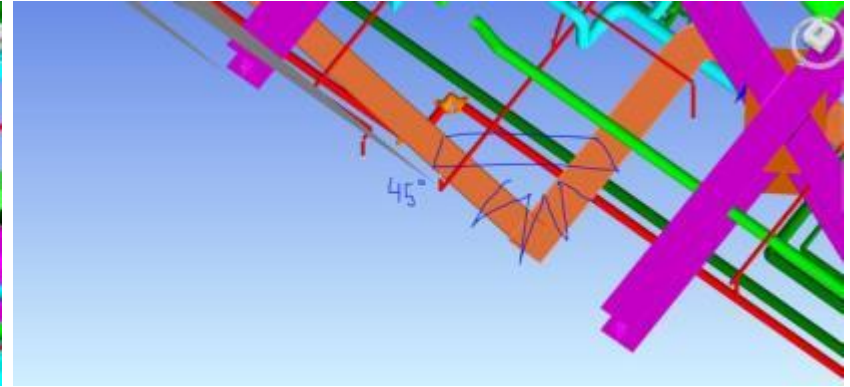
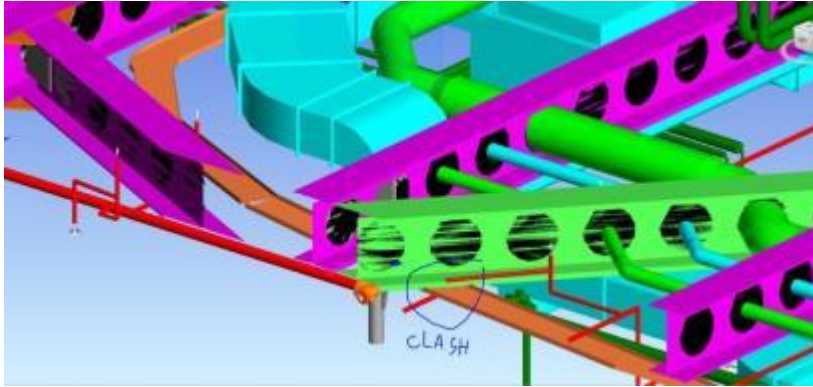
Limitations

- Change in habits/processes
- Investment in knowledge & tools
- Waiting for others
- Need for long-term objectives

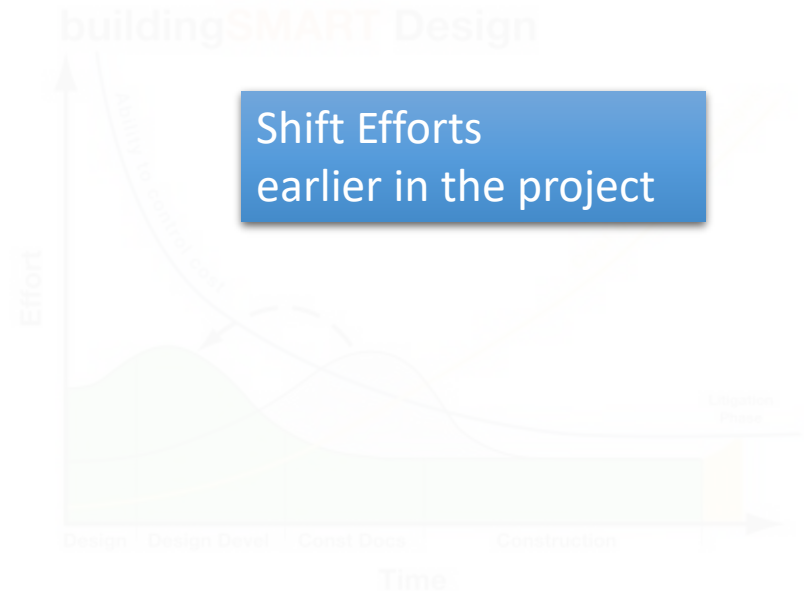
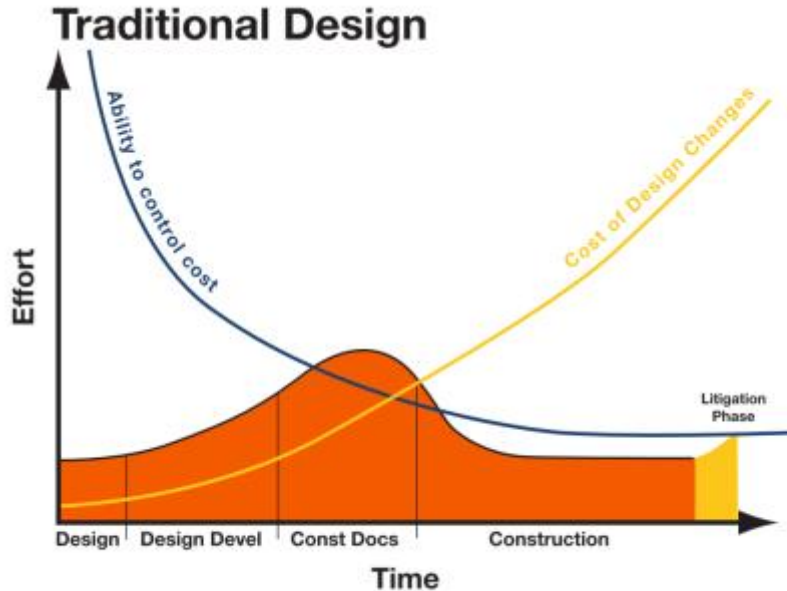
Visualisation



Issue finding & tracking



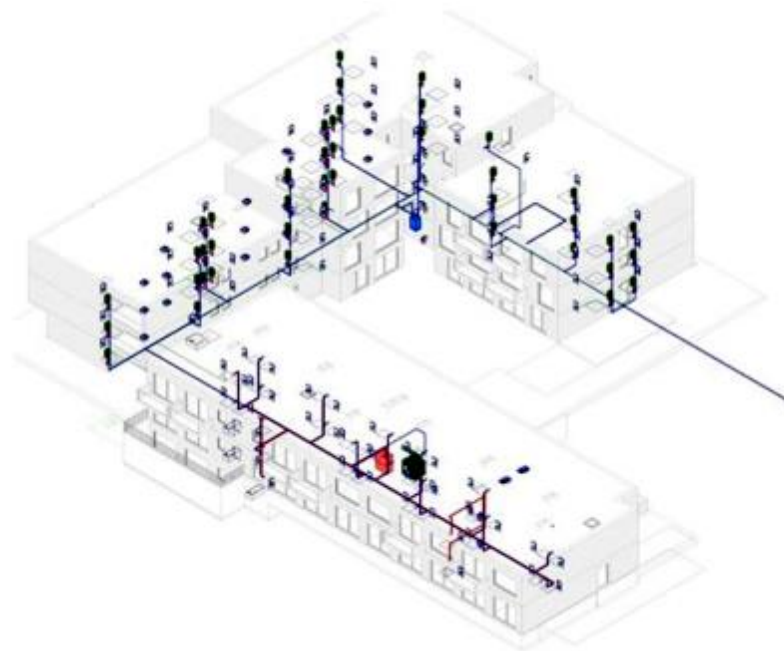
Solution to implement changes earlier



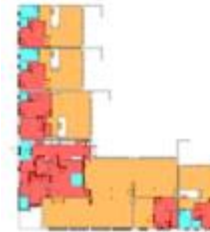
"Earlier Decision Making Improves Ability To Control Costs" – Graphs courtesy of Patrick MacLeamy, President of HOK and IAI International



Pricing & quantities



BE_DTP_0_010_1_Overheid - Heidebeek (H3) - volgens NEN 1086-001									
Overzicht installatie									
WITTE/GEEL/ROOD					MINIMALE RIJENLUCHT		DEBIETEN EFFECTIEF GEPLAATSTE RIJENLUCHT		
Transmissie	Afvoer	Stroom	Transmissie	Return surface	Afvoer	Control	Transmissie	Afvoer	Control
104 m³/h	20 m³/h	Pulse	104 m³/h	Specified	0 m³/h	ONTTOEGEWEND	104 m³/h	0 m³/h	0 m³/h
50 m³/h	70 m³/h	Extracool	0 m³/h	Specified	70 m³/h	ONTTOEGEWEND	0 m³/h	70 m³/h	0 m³/h
0 m³/h	0 m³/h	Overstroom	0 m³/h	Specified	0 m³/h	OK	0 m³/h	0 m³/h	0 m³/h
0 m³/h	0 m³/h	Extracool	0 m³/h	Specified	0 m³/h	OK	0 m³/h	0 m³/h	0 m³/h
20 m³/h	50 m³/h	Extracool	0 m³/h	Specified	50 m³/h	ONTTOEGEWEND	0 m³/h	50 m³/h	0 m³/h
40 m³/h	20 m³/h	Pulse	30 m³/h	Specified	0 m³/h	ONTTOEGEWEND	30 m³/h	0 m³/h	0 m³/h
0 m³/h	0 m³/h	Overstroom	0 m³/h	Specified	0 m³/h	OK	0 m³/h	0 m³/h	0 m³/h
40 m³/h	20 m³/h	Pulse	40 m³/h	Specified	0 m³/h	ONTTOEGEWEND	0 m³/h	0 m³/h	0 m³/h
0 m³/h	0 m³/h	Extracool	0 m³/h	Specified	0 m³/h	OK	0 m³/h	0 m³/h	0 m³/h
0 m³/h	0 m³/h	Extracool	0 m³/h	Specified	0 m³/h	OK	0 m³/h	0 m³/h	0 m³/h
270 m³/h	220 m³/h		280 m³/h		280 m³/h		280 m³/h	220 m³/h	
40 m³/h	20 m³/h	Pulse	30 m³/h	Specified	0 m³/h	ONTTOEGEWEND	30 m³/h	0 m³/h	0 m³/h
20 m³/h	50 m³/h	Extracool	0 m³/h	Specified	50 m³/h	ONTTOEGEWEND	0 m³/h	50 m³/h	0 m³/h
0 m³/h	0 m³/h	Overstroom	0 m³/h	Specified	0 m³/h	OK	0 m³/h	0 m³/h	0 m³/h
40 m³/h	20 m³/h	Pulse	40 m³/h	Specified	0 m³/h	ONTTOEGEWEND	0 m³/h	0 m³/h	0 m³/h
0 m³/h	0 m³/h	Extracool	0 m³/h	Specified	0 m³/h	OK	0 m³/h	0 m³/h	0 m³/h
0 m³/h	0 m³/h	Extracool	0 m³/h	Specified	0 m³/h	OK	0 m³/h	0 m³/h	0 m³/h
104 m³/h	20 m³/h	Pulse	100 m³/h	Specified	0 m³/h	ONTTOEGEWEND	100 m³/h	0 m³/h	0 m³/h
50 m³/h	70 m³/h	Extracool	0 m³/h	Specified	70 m³/h	ONTTOEGEWEND	0 m³/h	70 m³/h	0 m³/h
0 m³/h	0 m³/h	Overstroom	0 m³/h	Specified	0 m³/h	OK	0 m³/h	0 m³/h	0 m³/h
0 m³/h	0 m³/h	Extracool	0 m³/h	Specified	0 m³/h	OK	0 m³/h	0 m³/h	0 m³/h
270 m³/h	220 m³/h		280 m³/h		280 m³/h		280 m³/h	220 m³/h	



Gelijkvloers - afgifte



Niv 1 - afgifte



Niv 2 - afgifte



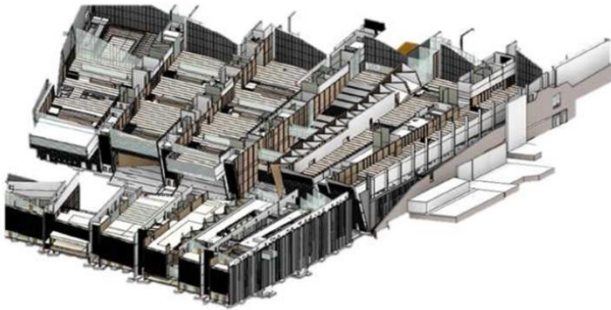
Kelder - afgifte

Verwarming - afgifte:

- (none)
- 0_Oververmied
- Radiatoren
- Vloerverwarming

1. What is BIM: General introduction: case study

Grand Egyptian Museum: Start March 2012 => Planned End May 2018



How many conflicts were detected?
29631

Many opportunities but

Complexity of today's 02. situation

Many different (local) standards

- **National & International**

- UK (COBIE, CIBSE, ...)
- USA
- Netherlands (ETIM, DRS)
- Norway, Finland
- Germany, Spain, Austria, Australia ...

- **ISO BIM Standards**

- ISO 16739 (IFC)
- ISO 12006 (Construction – Organisation of Information)
- ISO 29481 (IDM)
- ISO 12911 (BIM framework)

- **CEN E442**

- **Uniclass, Omniclass**

- ...



DATA?
WHERE? HOW?

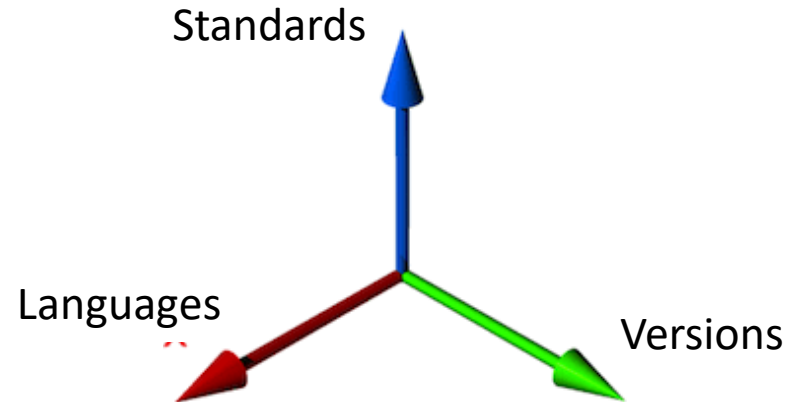
Different software versions

- Revit '15, '16, '17
- Archicad
- IFC
- Sketch up
- ...



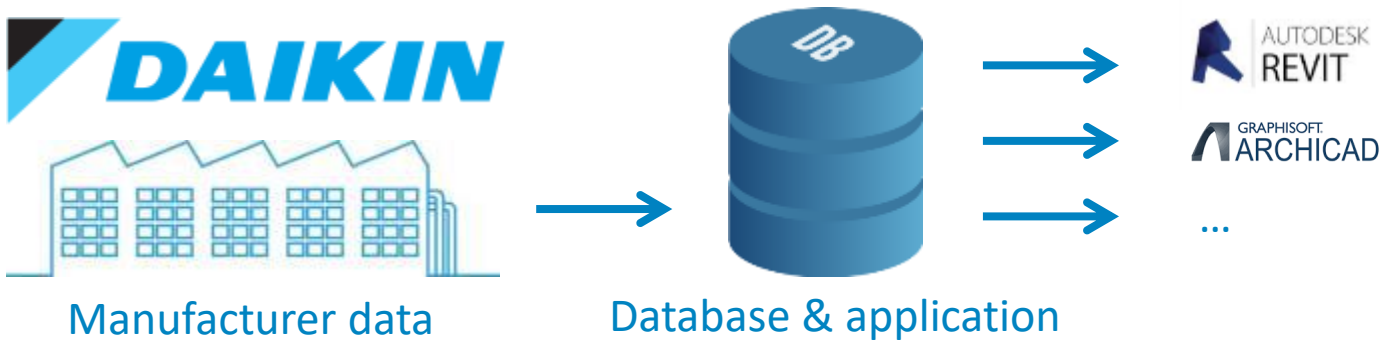
Result for manufacturers

- Which standard to follow?
 - Different standard objects needed for European/global companies
- Which software versions to support?
- Which languages to support?
-



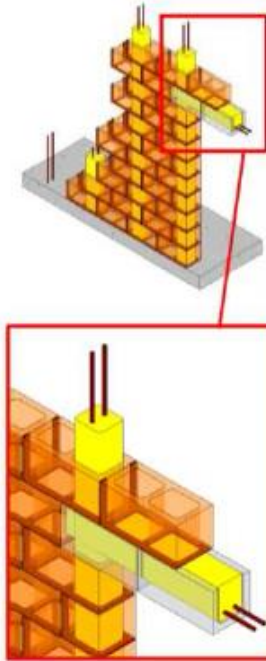
How to cope with the complexity?

- Database driven objects
- On-the-fly generation of objects
- Direct link with object users



1. What is BIM: General introduction : Level of Detail

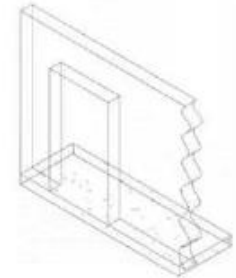
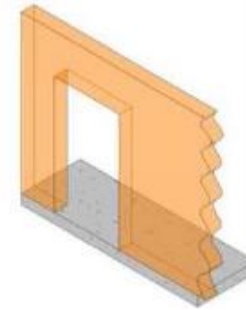
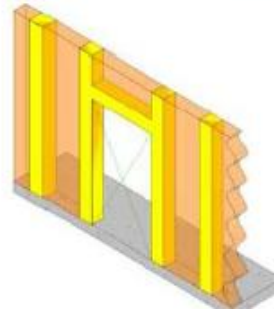
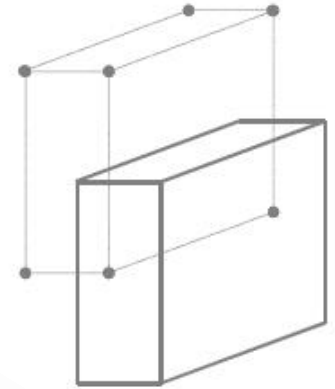
BIM



DAIKIN
Specific



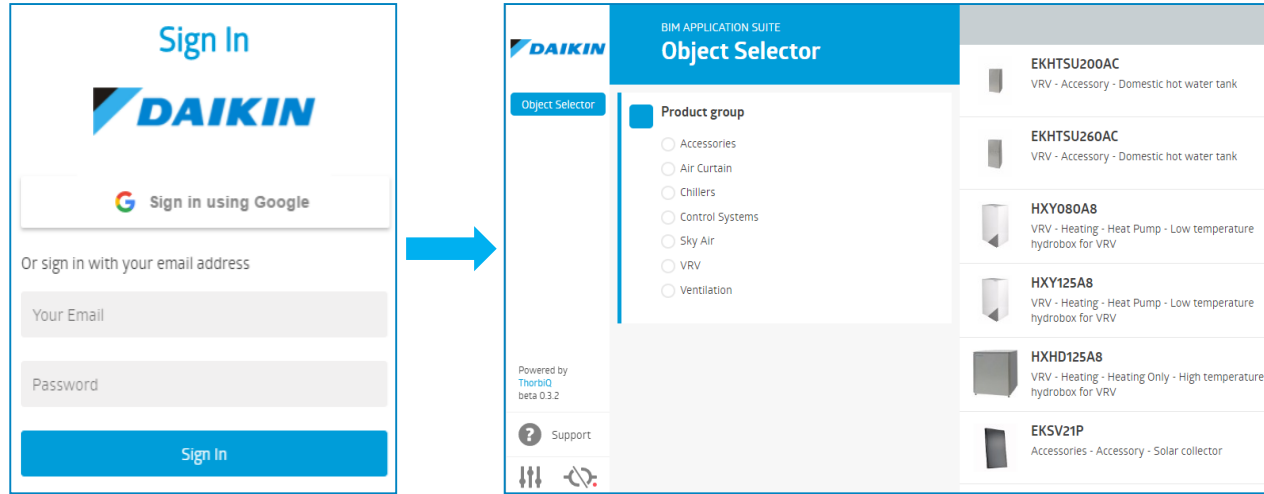
DAIKIN
Generic



Daikin object are available from Generic (low level detail) up to Specific (very detailed)

3. Available Daikin tool: New Daikin Application Suite

- › Launched: September '17
- › Url: <http://bim.daikin.eu/>
- › Pro's
 - + Easy follow up
 - + Objects up to date
 - + Easy navigation
 - + Several standards supported
 - + Revit information



Current status

Available product ranges

- VRV/Sky Air (Sept 2017)
- Small Chillers (Sept 2017)
- Air Curtains
- Ventilation units (Sept 2017)

To be expected

Expected product ranges

- FCU (F18)
- Heating (F18)
- Split (Q4 2017)
- Refrigeration (Q4 2017)

More to be expected

More standards: IFC (country specific)
More object types



- Specific
- Generic

Automated object creation
Further portal extension
Single sign on

The need for standardisation

03. The future

Future Dimensions

3D (3D Model)	4D (Schedule)	3D BIM	5D BIM	5D (Cost)	6D (Building Lifecycle Information)
		Building also include the ability to walk through to create a simulation.	Associates the development costs per stage to get a detailed cash flow planning	_____ \$ _____ \$ _____ \$ _____ \$ _____ \$	eLibrary: » Who? » When? » Where? » How much?
		4D BIM	6D BIM		
		Adds time for each stage of the development identifying best planning.	Links all data of the development to facilitate cost effective building operation.		

Benefits:

- › Better communication between stakeholders (Architects, Consultant, Contractors)
- › Building conflicts can be detected at early design stage
- › Shorter construction lead time
- › Better management of construction time & maintenance” costs

Future Technology & Integration

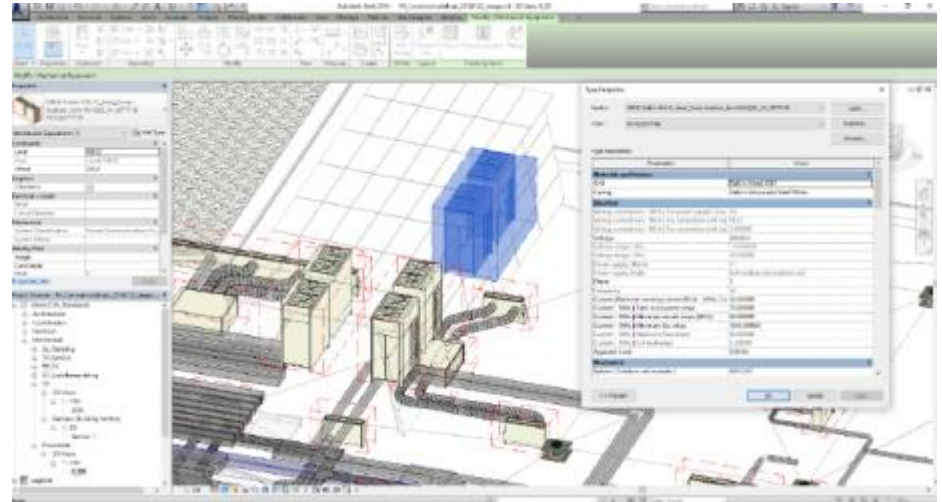
- Virtual Reality & Interactive Applications
- Mobile devices on site
- “Smart buildings”
 - Embedded sensors & data
- From model to fabrication
 - Piping design
 - 3D Printing



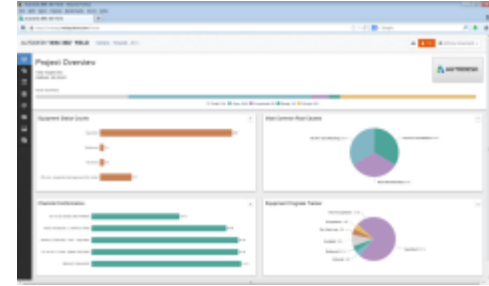
<http://www.equipmentworld.com/bim-and-ipad-use-quickly-gaining-traction-in-construction-industry-thanks-to-productivity-boosts/>

Energy performance & IEQ

- Calculate energy performance of buildings
- Digital certification of energy performance
 - BREEAM certificates
 - ...
- Create passport of used materials
Refrigerant content calculation
- Noise calculation



Commissioning & maintenance



- Link between model & site
- Availability of information (models, drawings, manuals, warranty information...)
- Follow-up of construction/maintenance
- Quick issue reporting from tablets

Daikin BIM users > 180 countries

Double digit growth BIM object
downloads



BIM

Get all information
www.daikin.eu/BIM

Or download Daikin BIM
objects on:
<http://bim.daikin.eu>

!

Be up to date regarding BIM Information

- › Get the latest news about Daikin BIM objects
- › Refresh at any time your knowledge

!

Tailor made BIM objects

- › BIM objects made for national regulations/requirements
- › Get different level of details depending on project requirements

!

Explore Daikin BIM Objects

- › Get the latest updated Daikin BIM objects
- › Explore VRV, Sky Air, AHU, Chillers, ... BIM objects

!

Get our plug-in Daikin Ribbon

- › Be time efficient
- › Easy working way

Thank you