EuHPN 2014 Workshop, Edinburgh 1-3 October

Current state of BIM and Streamer
The architects design methodology

dJGA

Streamer
European research on energy-efficient healthcare districts

@martjandenhoed

Operations director · Architect @dJGAarchitecten

Uses #Revit for #BIM

Board member RevitUserGroup (RevitGG)

Father of 2 · Married · 33

European research on energy-efficient healtcare districts

Streamer
European research on energy-efficient healthcare districts

de jong gortemaker algra

European research on energy-efficient healtcare districts

Project full title:

“Semantics-driven Design through Geo and Building Information Modeling for Energy-efficient Building Integrated in Mixed-use Healthcare Disctricts”

Streamer
European research on energy-efficient healthcare districts

European Commission

de jong gortemaker algra

European research on energy-efficient healtcare districts

Project full title:

“Semantics-driven Design through Geo and Building Information Modeling for Energy-efficient Building Integrated in Mixed-use Healthcare Disctricts”

Project theme:

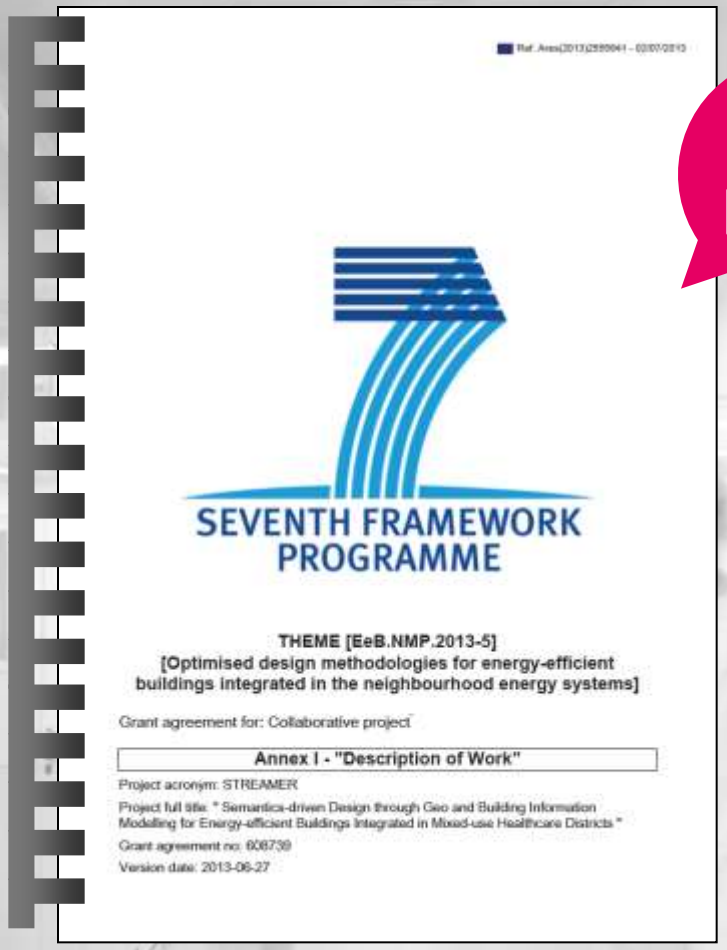
“Optimised design methodologies for energy-efficient buildings integrated in the neighbourhood energy systems”

Streamer

European research on energy-efficient healthcare districts

European Commission

de jong gortemaker algra

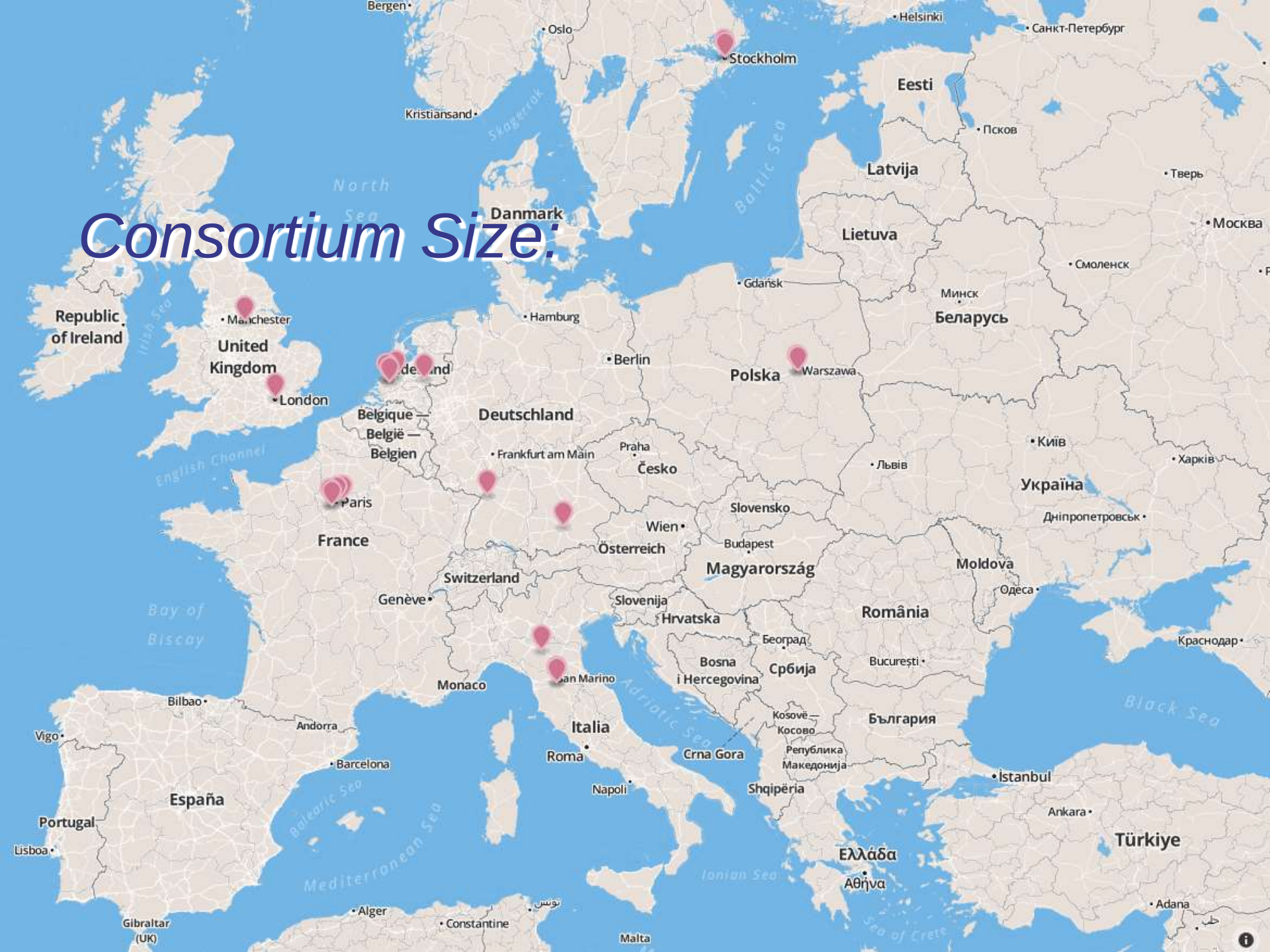

SEVENTH FRAMEWORK
PROGRAMME
THEME [EeB.NMP.2013-5]
[Optimised design methodologies for energy-efficient buildings integrated in the neighbourhood energy systems]
Grant agreement for: Collaborative project
Annex I - "Description of Work"
Project acronym: STREAMER
Project full title: " Semantics-driven Design through Geo and Building Information Modelling for Energy-efficient Buildings Integrated in Mixed-use Healthcare Districts "
Grant agreement no: 608739
Version date: 2013-06-27

aka
DOW

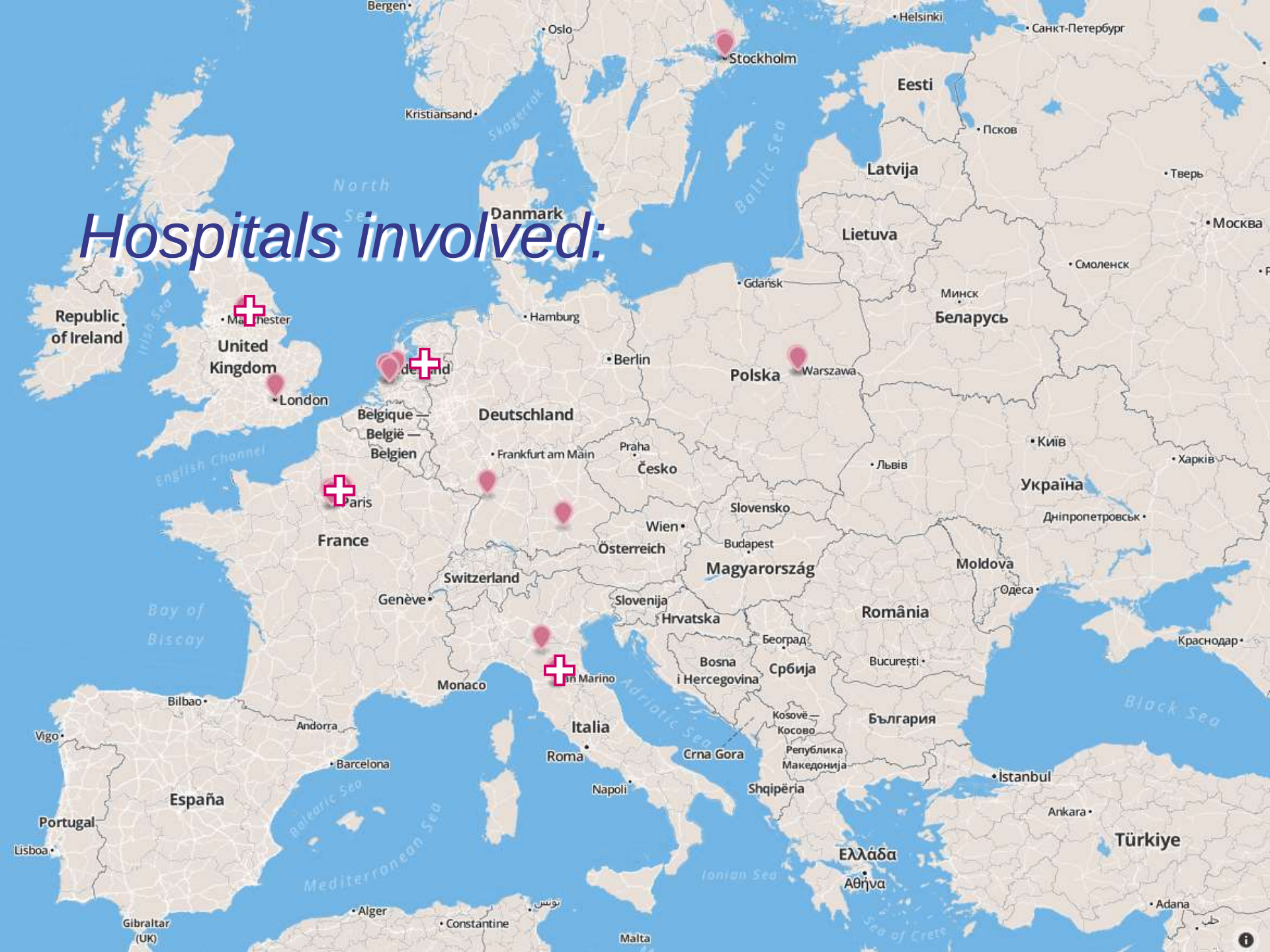
Consortium Size:

20 companies, 7 nationalities
10 workpagages,
29 tasks
4 year

Consortium Size:



Hospitals involved:




Hospitals involved for benchmarking:
4 + 20 hospitals
Bergen
Oslo
Helsinki
Санкт-Петербург
Stockholm
Eesti
Kristiansand
Псков
Latvija
Тверь
North Sea
Baltic Sea
Danmark
Москва
Gdańsk
Минск
Беларусь
Republic of Ireland
Manchester
United Kingdom
Hamburg
Berlin
Polska
Warszawa
London
Belgique — België — Belgien
Deutschland
Praha
Київ
Харків
Україна
Paris
France
Wien
Österreich
Budapest
Magyarország
Moldova
Дніпропетровськ
Switzerland
Genève
Slovenija
Hrvatska
Одеса
România
Београд
Краснодар
Bosna i Hercegovina
Србија
București
Monaco
San Marino
Bilbao
Andorra
Vigo
Italia
Roma
Crna Gora
Kosovë — Косово
Република Македонија
България
Barcelona
Napoli
Shqipëria
İstanbul
España
Portugal
Lisboa
Ankara
Türkiye
Ελλάδα
Αθήνα
Gibraltar (UK)
Alger
Constantine
Malta
Adana

energie atomique • energies alternatives

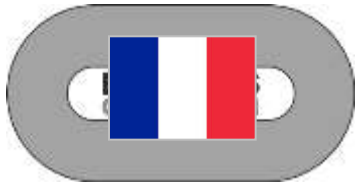








Karlsruhe Institute of Technology





Rijnstate







VÄRDEN FÖR VÄRDEN

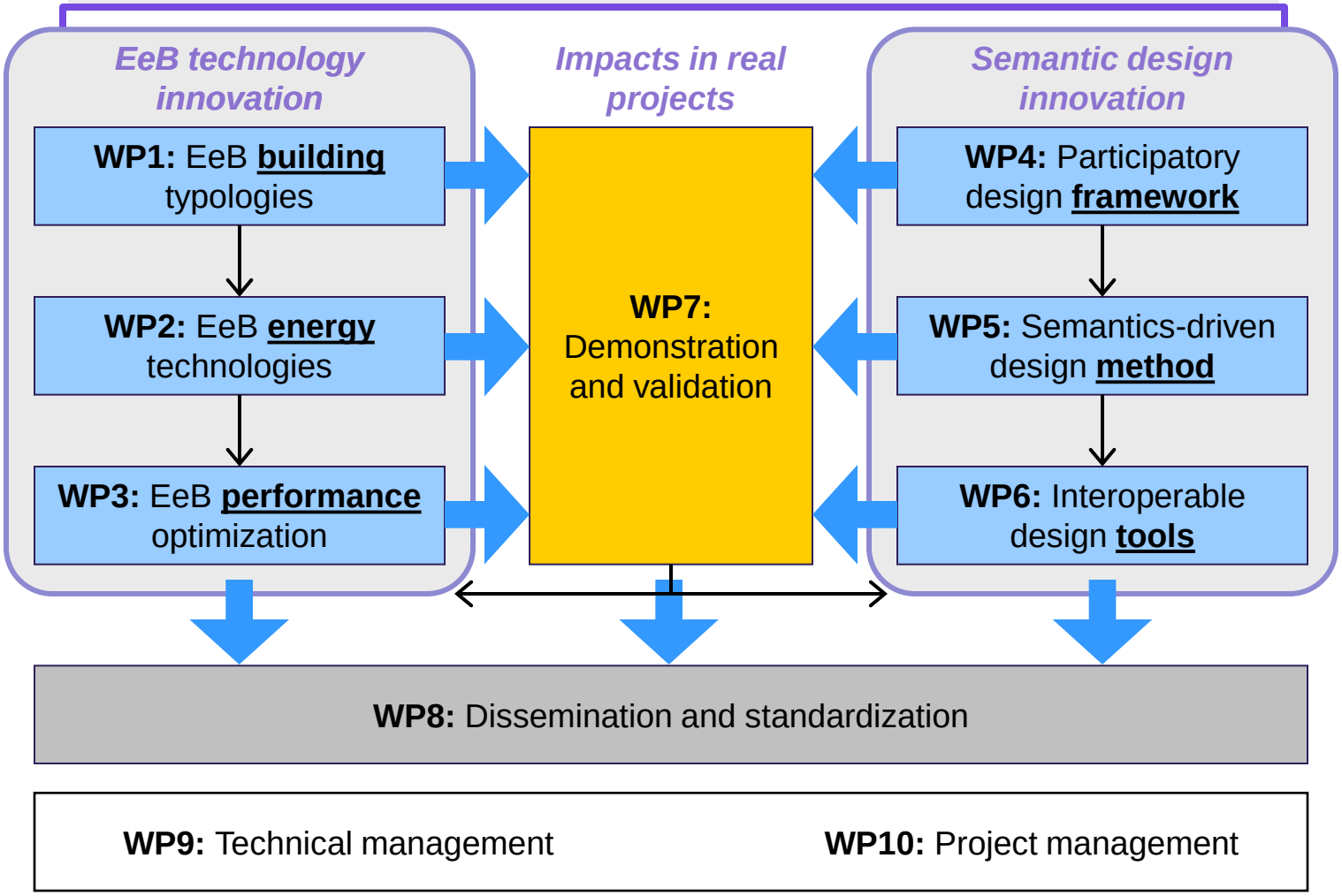
Planning

	Activity type	WP/Task leader	Year 1			Year 2		Year 3		Year 4	
			M1	M6	M12	M18	M24	M30	M36	M42	M48
WP1: EeB building typologies	**RTD**	**IAA**									
T1.1: Typology models of healthcare districts		IAA			D1.1		D1.2				
T1.2: Scenarios for energy-efficiency retrofitting		ARU				D1.3			D1.4		
T1.3: Precedence-based design for new buildings		DJG				D1.5					D1.6
WP2: EeB energy technologies	**RTD**	**MOW**									
T2.1: EeB solutions for MEP and energy systems		MOW			D2.1		D2.2				D2.3
T2.2: EeB solutions for building space and envelope		IAA			D2.4		D2.5				D2.6
T2.3: Integrated neighbourhood energy systems		DWA				D2.7			D2.8		
WP3: EeB performance optimisation	**RTD**	**DMO**									
T3.1: EeB performance indicators		ARU			D3.1		D3.2				
T3.2: Simulation tools of energy performance		CST				D3.3			D3.4		
T3.3: LCC and design decision-support tool		DMO				D3.5			D3.6		
WP4: Participatory design framework	**RTD**	**NCC**									
T4.1: Collaborative process of semantic design		BOU				D4.1			D4.2		
T4.2: Semantic knowledge management		TNO				D4.3			D4.4		
T4.3: EeB IPD framework		NCC							D4.5		
WP5: Semantics-driven design method	**RTD**	**AEC**									
T5.1: Semantic ontologies for EeB		AEC				D5.1			D5.2		
T5.2: Model-based Product Lifecycle Management		CST					D5.3				D5.4
T5.3: Parametric modelling and object libraries		DJG					D5.5				D5.6
WP6: Interoperable design tools	**RTD**	**KIT**									
T6.1: Semantic design configurator		MAE					D6.1				D6.2
T6.2: Building and neighbourhood energy simulator		KIT					D6.3		D6.4		
T6.3: Integration platform for BIM and GIS data		TNO				D6.5					D6.6
WP7: Demonstration and validation	**DEM**	**CEA**									
T7.1: Demonstration project in the UK		TRF				D7.1			D7.2		
T7.2: Demonstration project in the Netherlands		RNS				D7.3			D7.4		
T7.3: Demonstration project in Italy		AOC				D7.5			D7.6		
T7.4: Demonstrationproject in France		APH				D7.7			D7.8		
T7.5: Benchmarking at EU level		CEA				D7.9					D7.10

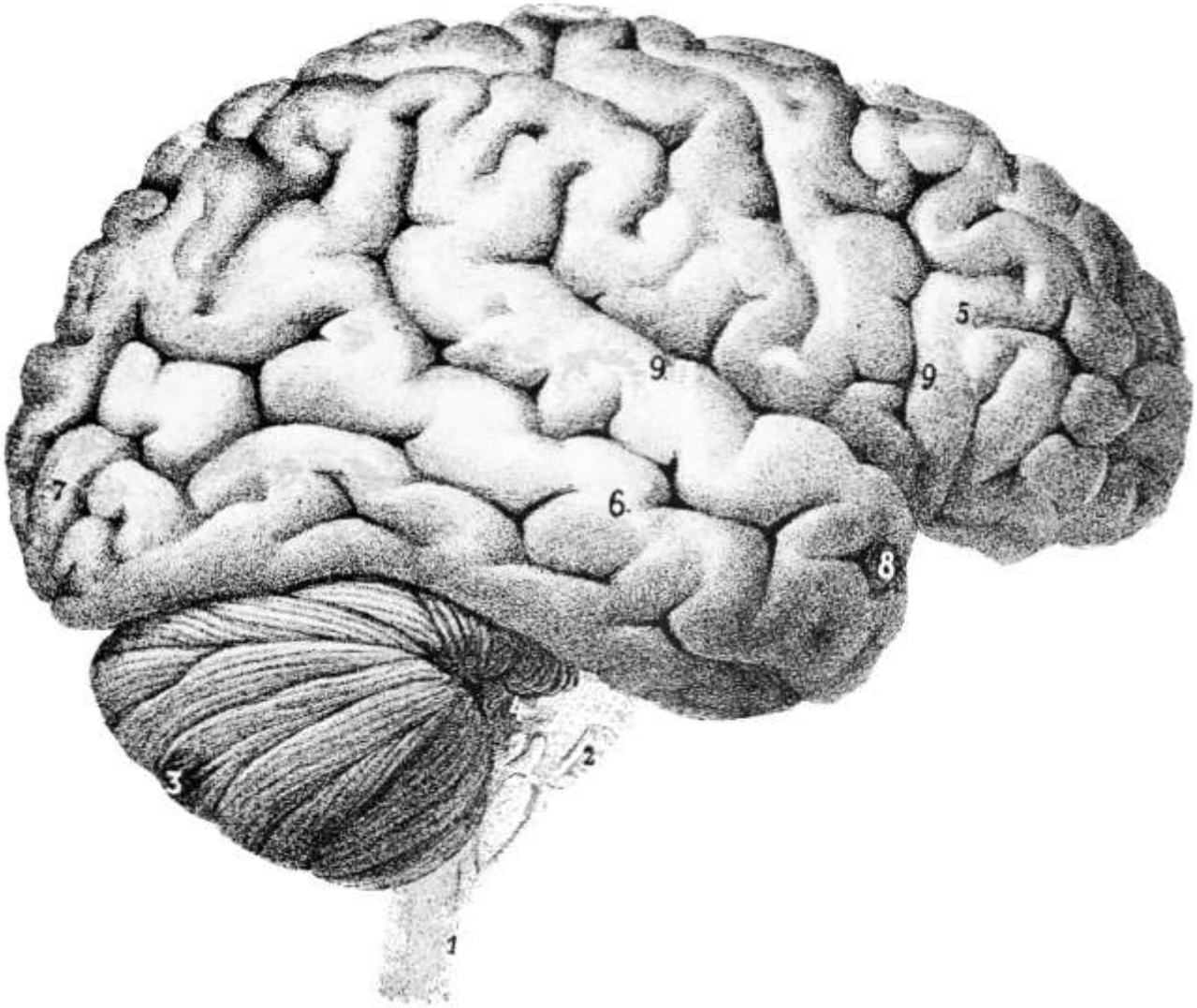
Sept 2017


how wil Streamer
accomplish this?

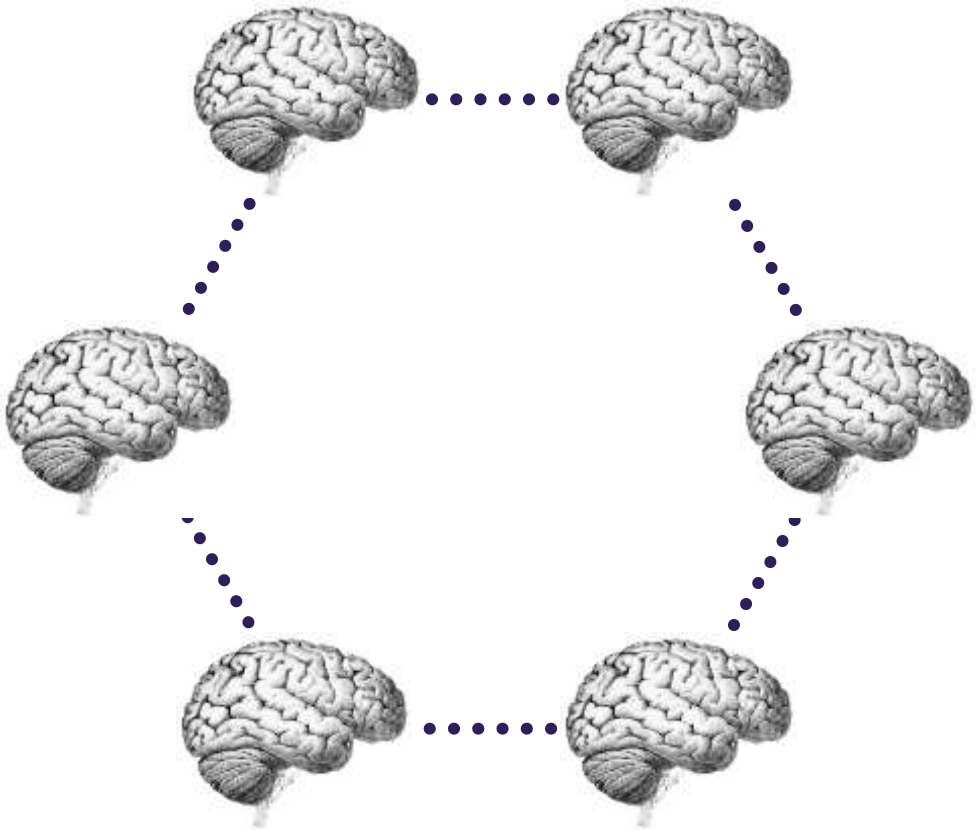
Basic enhancements.



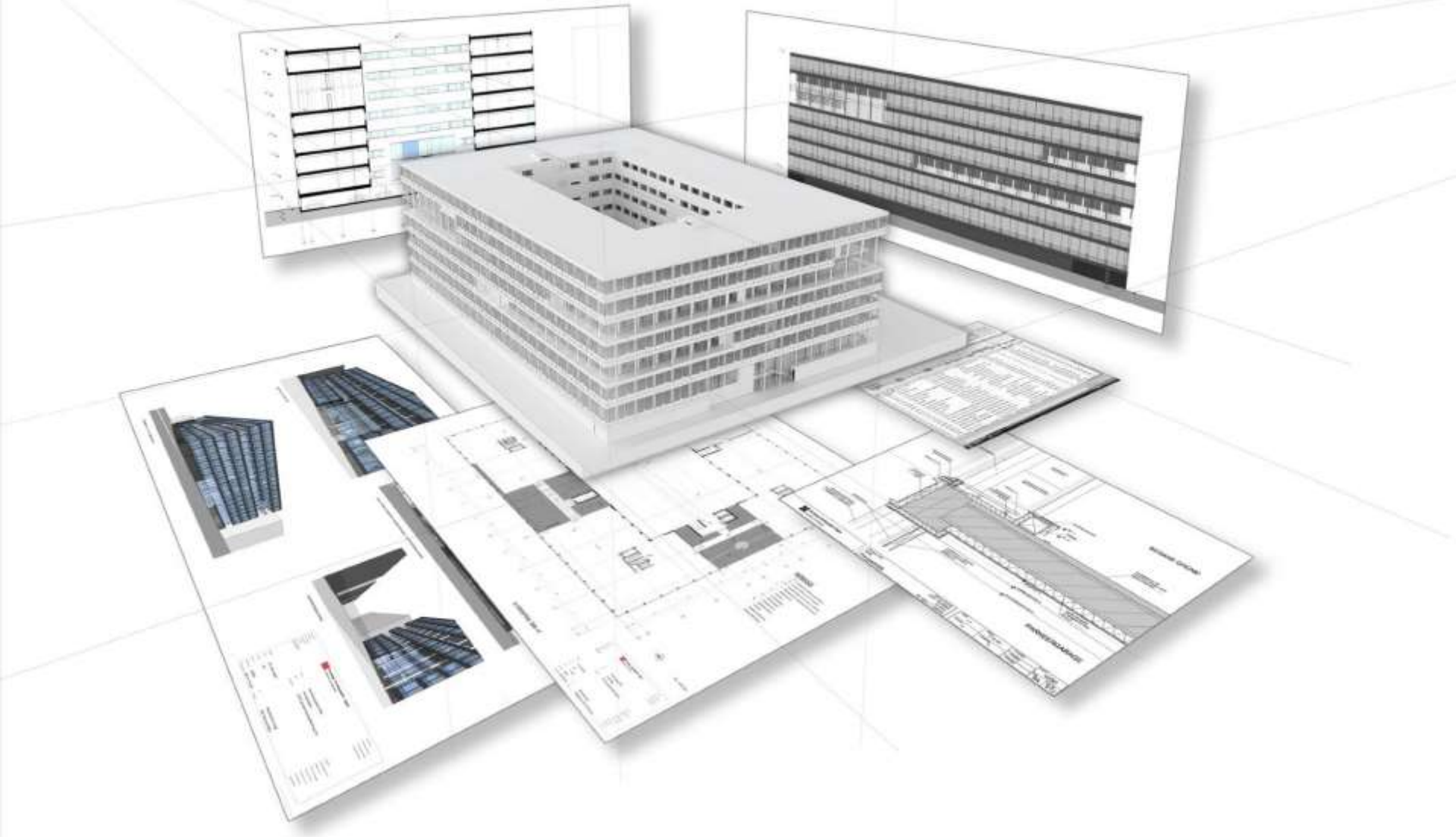
Knowledge earlier in design process

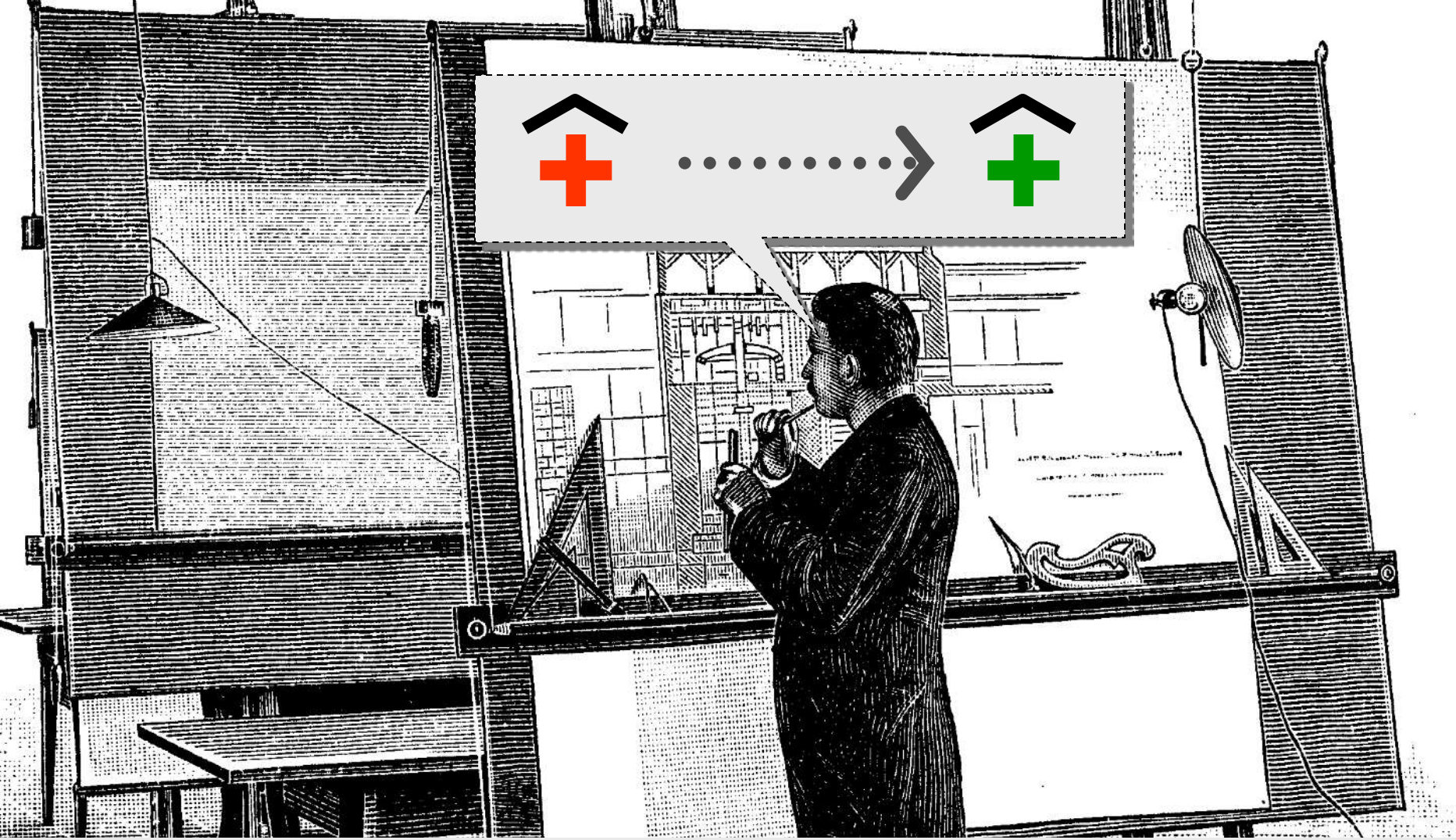


Better interdisciplinary co-operation with team members



Building Information Modelling





At present and in the near future, clients, architects, technical designers, contractors, and end-users really need a **breakthrough** in **designing energy-efficiency buildings** integrated in the healthcare districts.


bim

10 Year!

Bouwmeester R.

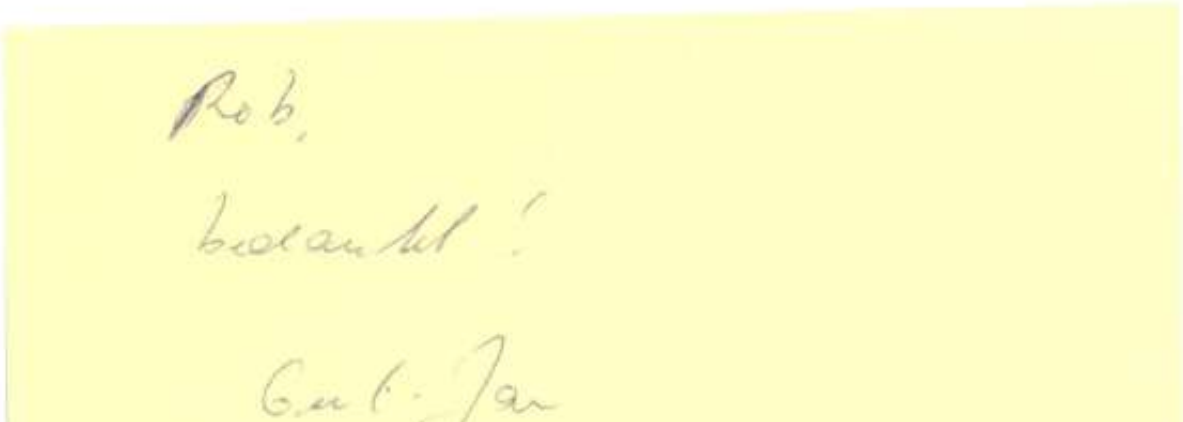
Van: Gortemaker R.H.
Verzonden: vrijdag 29 oktober 2004 17:06
Aan: Bouwmeester R.
Onderwerp: cadac

2004

Rob,

Ik heb vanmiddag akkoord gegeven op de nieuwe offer[illegible]zullen volgende week de pakketten uitleveren. Wat de cursussen en de onderzoeken betreft [illegible]g geen afspraak gemaakt qua datum. De cursussen zullen we verspreiden over dit jaar en volgend jaa[illegible]moeten we even vaststellen wie er mee gaat doen aan de cursussen. 3 dagen revit basis; 3 dagen revit gevorderden; 5 dagen autocad en 2 dagen viz, alle cursussen voor 6 personen. We zijn dus ook akkoord met beide onderzoekstrajecten (ontwerpafdeling en tekenkamer), cadac geeft hierop 50% korting. Edo weet er al van en heeft al contact met Cadac voor de installatie.

Roelof



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of course I
use bim!


architects
&
engineers
de jong gortemaker algra


architects
building engineers
structural engineers
interior architects
77 colleagues

Specials, complexity as challenge


Holland Particle Therapy Centre


St. Antonius Ziekenhuis Utrecht


High Care


Ziekenhuis Bernhoven


Kindcentrum De Driehoek


Deventer Ziekenhuis


Verkeersleidingspost ProRail

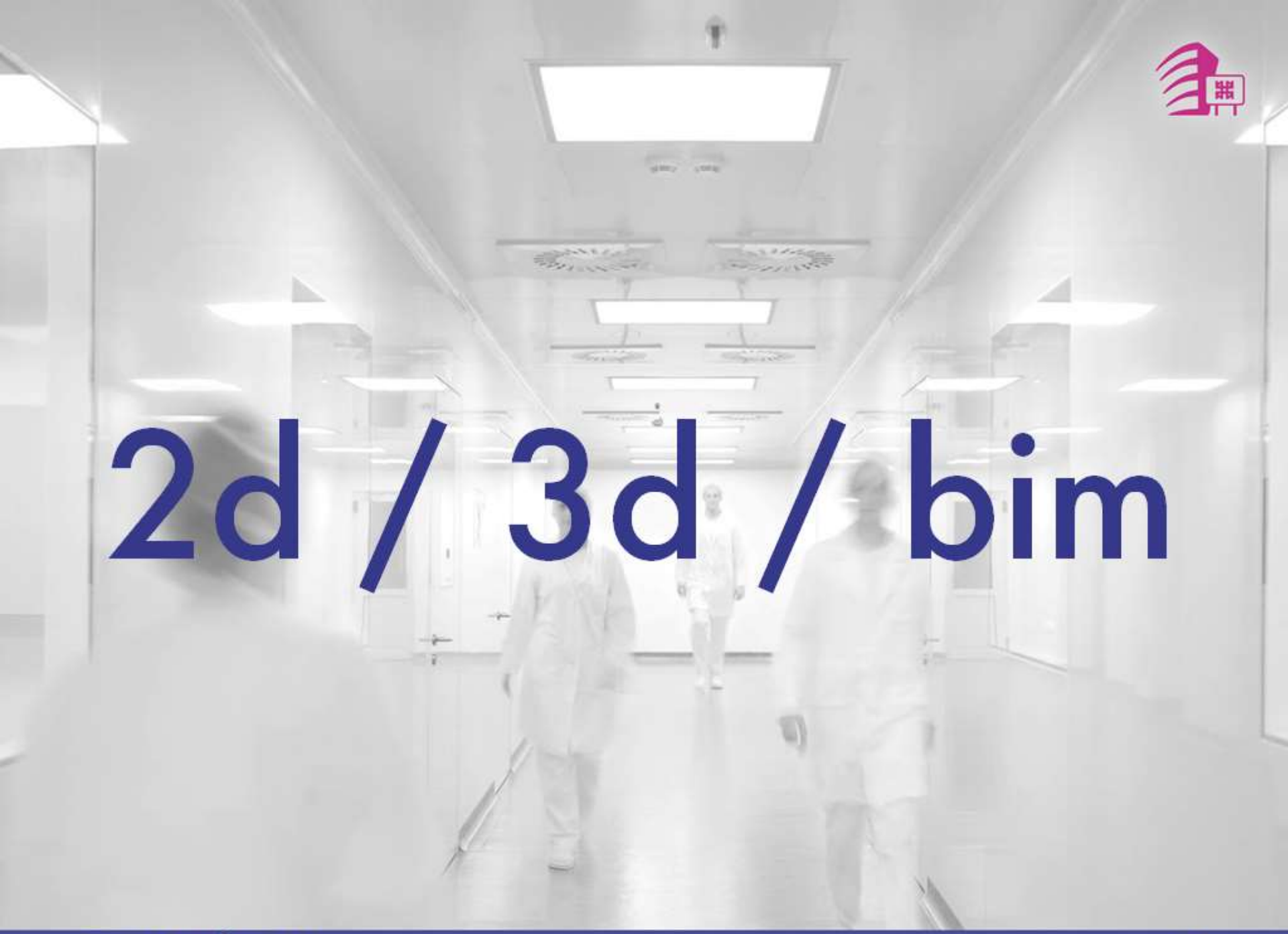

SportResort Zilveren Schor


Sint-Aloysiuscollege

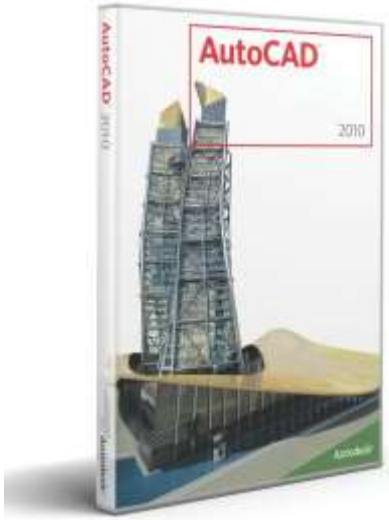

Parkeergarage St. Antonius Ziekenhuis Nieuwegein


Algemeen Ziekenhuis Jan Portaels


Campusader UZ Gent


2d / 3d / bim

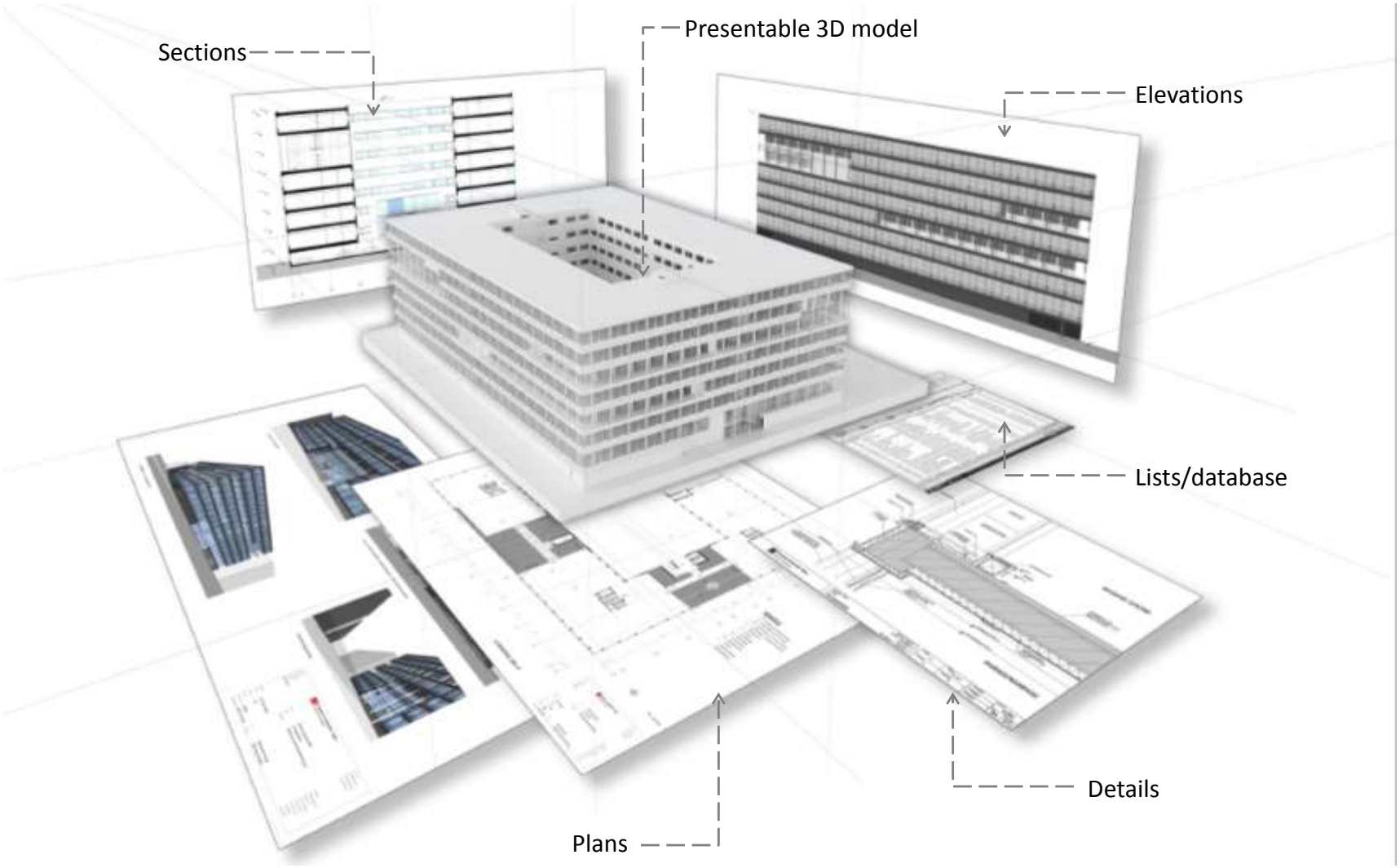
Degree of (r)evolution



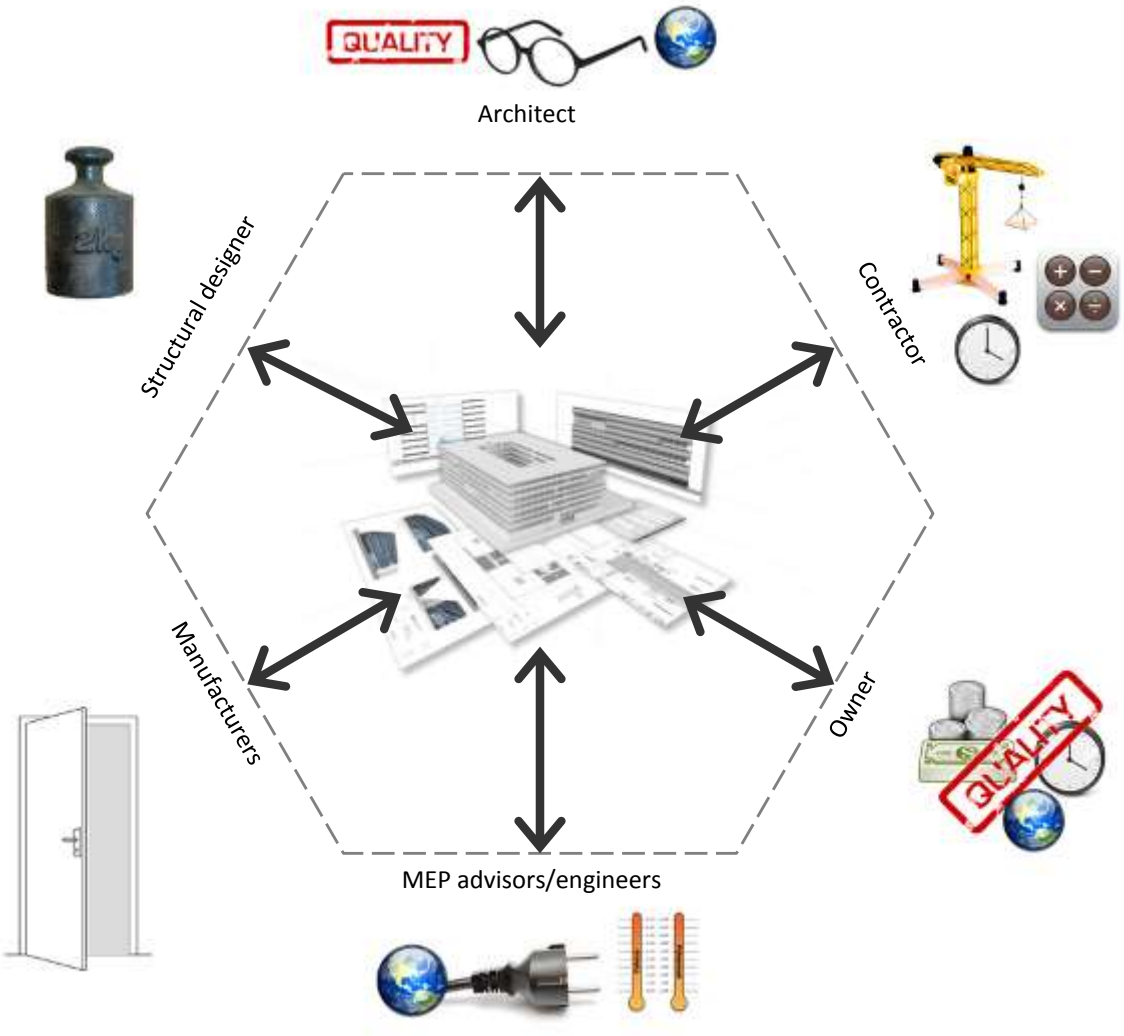
bim

Bigger cause of changes in process. In relation to the drawingboard.

What is BIM according to the architect

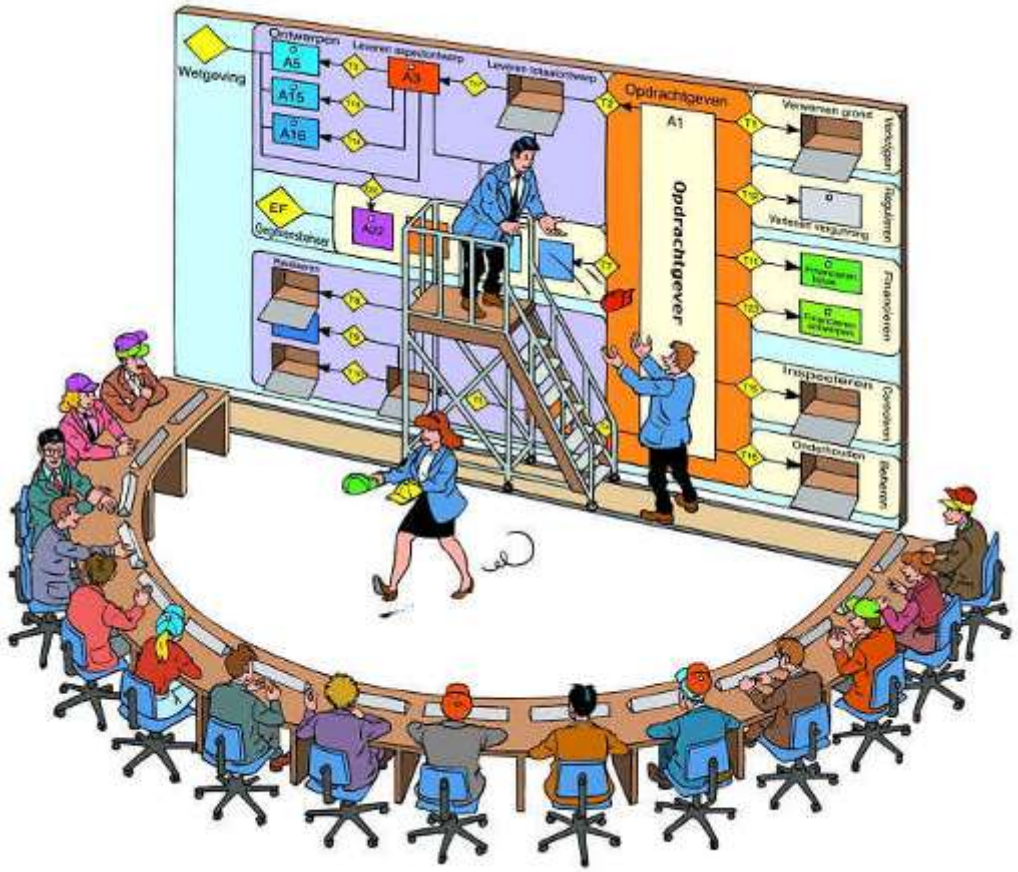


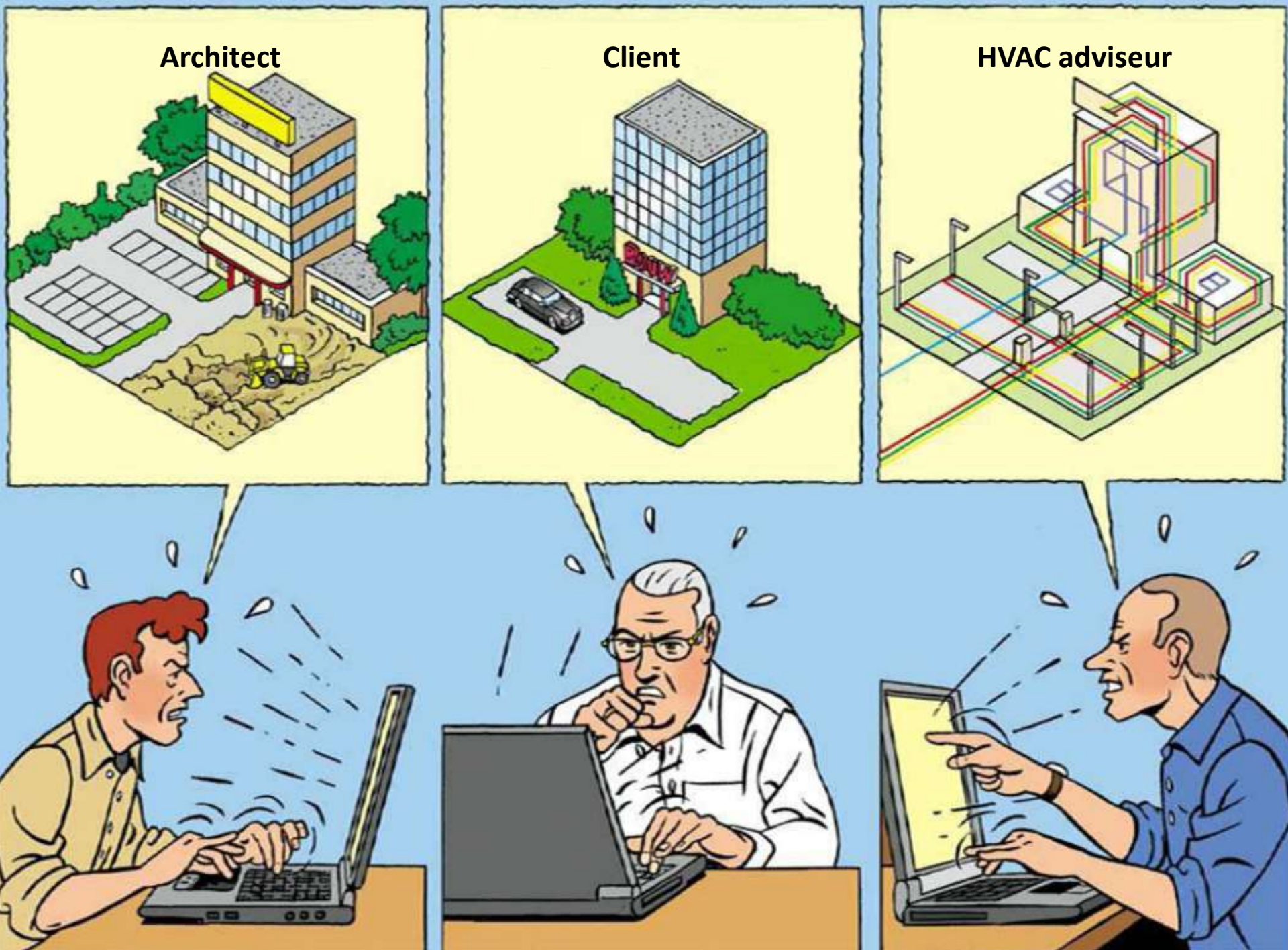
What is BIM according to other team members

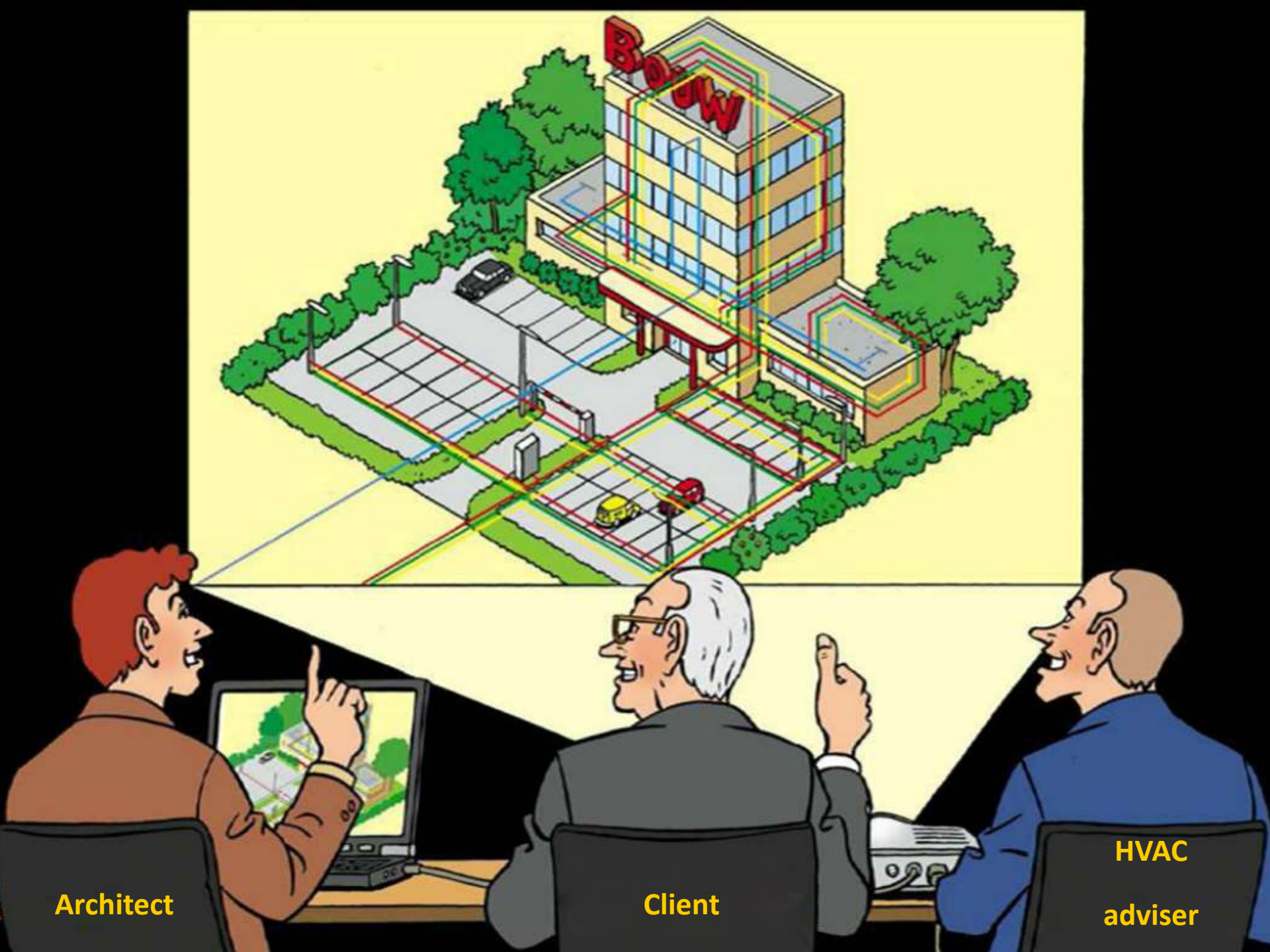


collaborate old fashion

collaborate with BIM

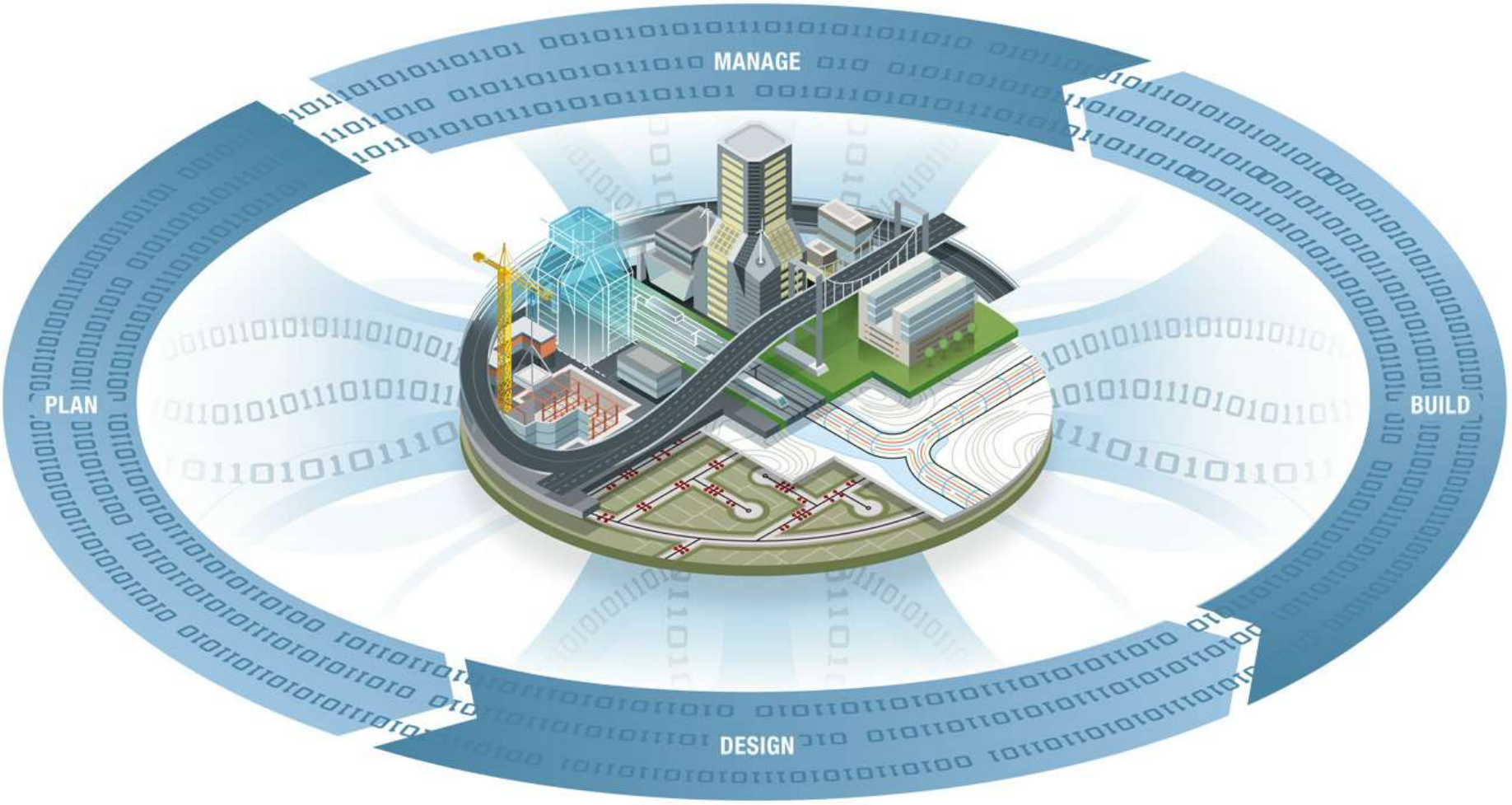


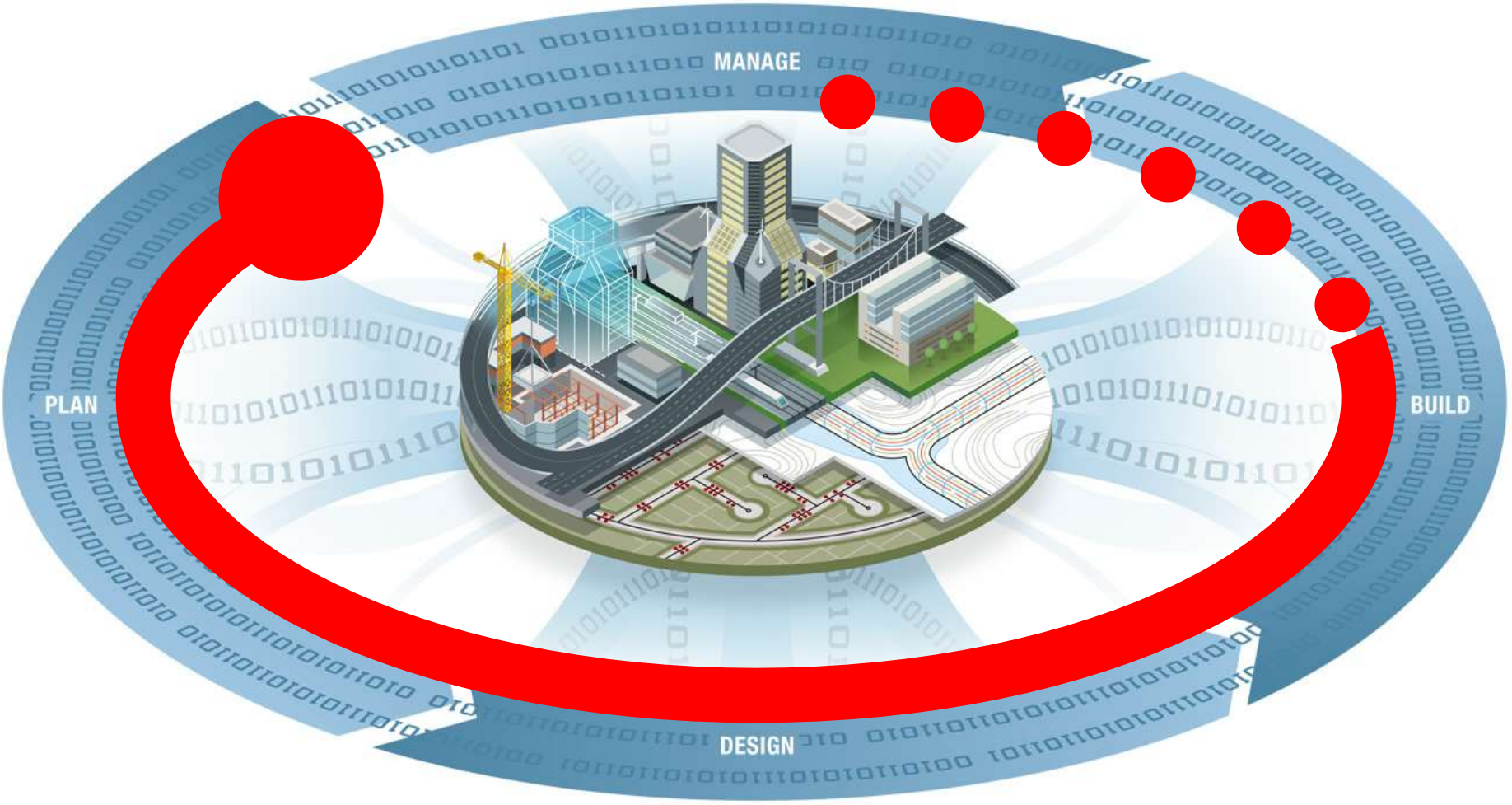

Architect
Client
HVAC adviseur


Architect
Client
HVAC
adviser


bim
roadmap


Bim =
not equal
3D model


MANAGE
PLAN
BUILD
DESIGN


MANAGE
PLAN
BUILD
DESIGN

UK

The UK Government Construction Strategy was published by the Cabinet office on 31 May 2011. The report announced the Governments intention to require: collaborative 3D BIM (with all project and asset information, documentation and data being electronic) on its projects by 2016.

Level 0

Unmanaged CAD probably 2D, with paper (or electronic paper) as the most likely data exchange mechanism.

Level 1

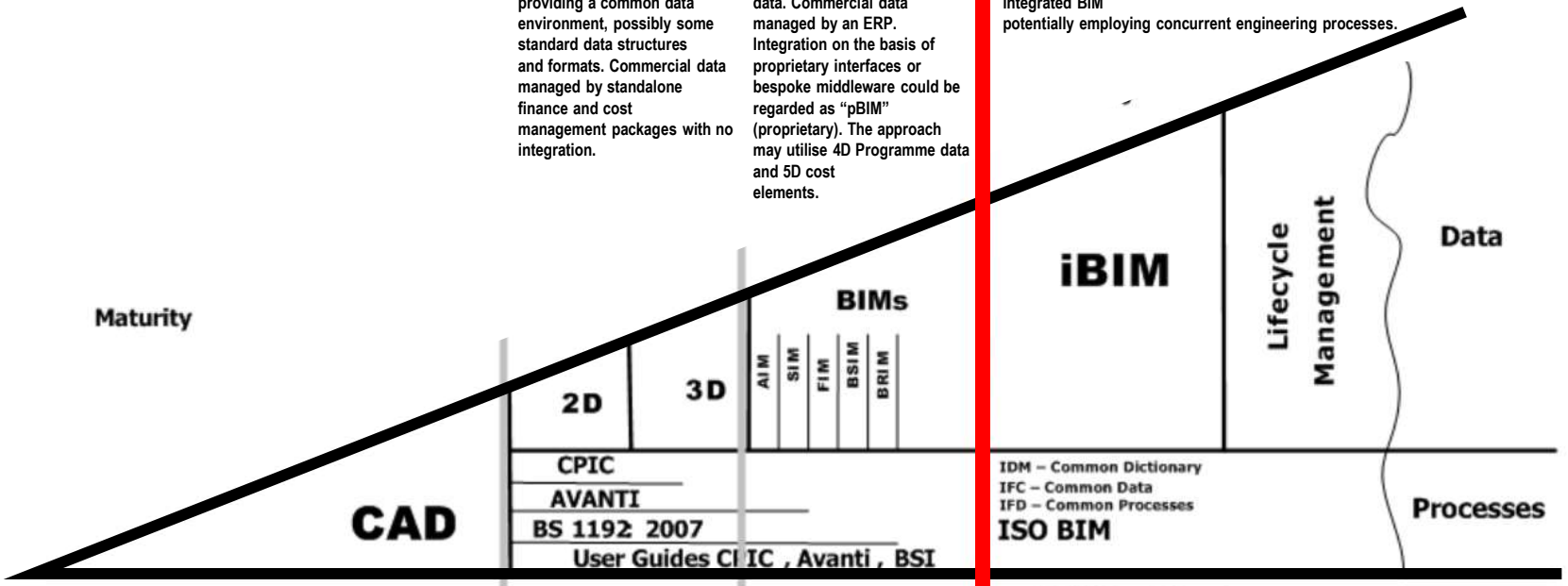
Managed CAD in 2 or 3D format using BS 1192:2007 with a collaboration tool providing a common data environment, possibly some standard data structures and formats. Commercial data managed by standalone finance and cost management packages with no integration.

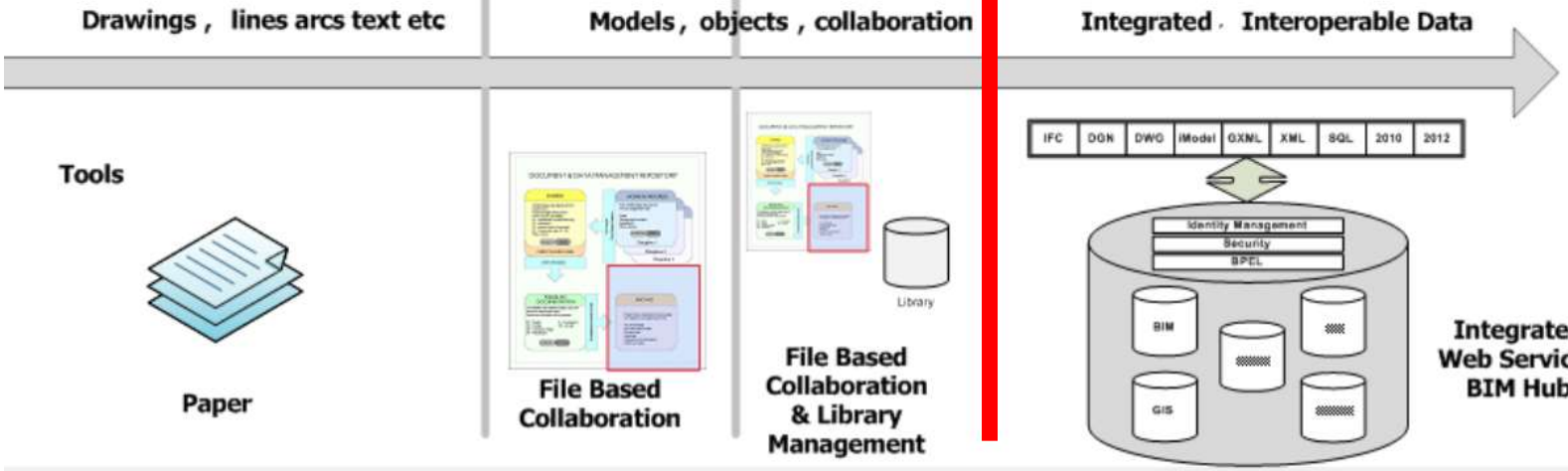
Level 2

Managed 3D environment held in separate discipline "BIM" tools with attached data. Commercial data managed by an ERP. Integration on the basis of proprietary interfaces or bespoke middleware could be regarded as "pBIM" (proprietary). The approach may utilise 4D Programme data and 5D cost elements.

Level 3

Fully open process and data integration enabled by IFC / IFD. Managed by a collaborative model server. Could be regarded as iBIM or integrated BIM potentially employing concurrent engineering processes.





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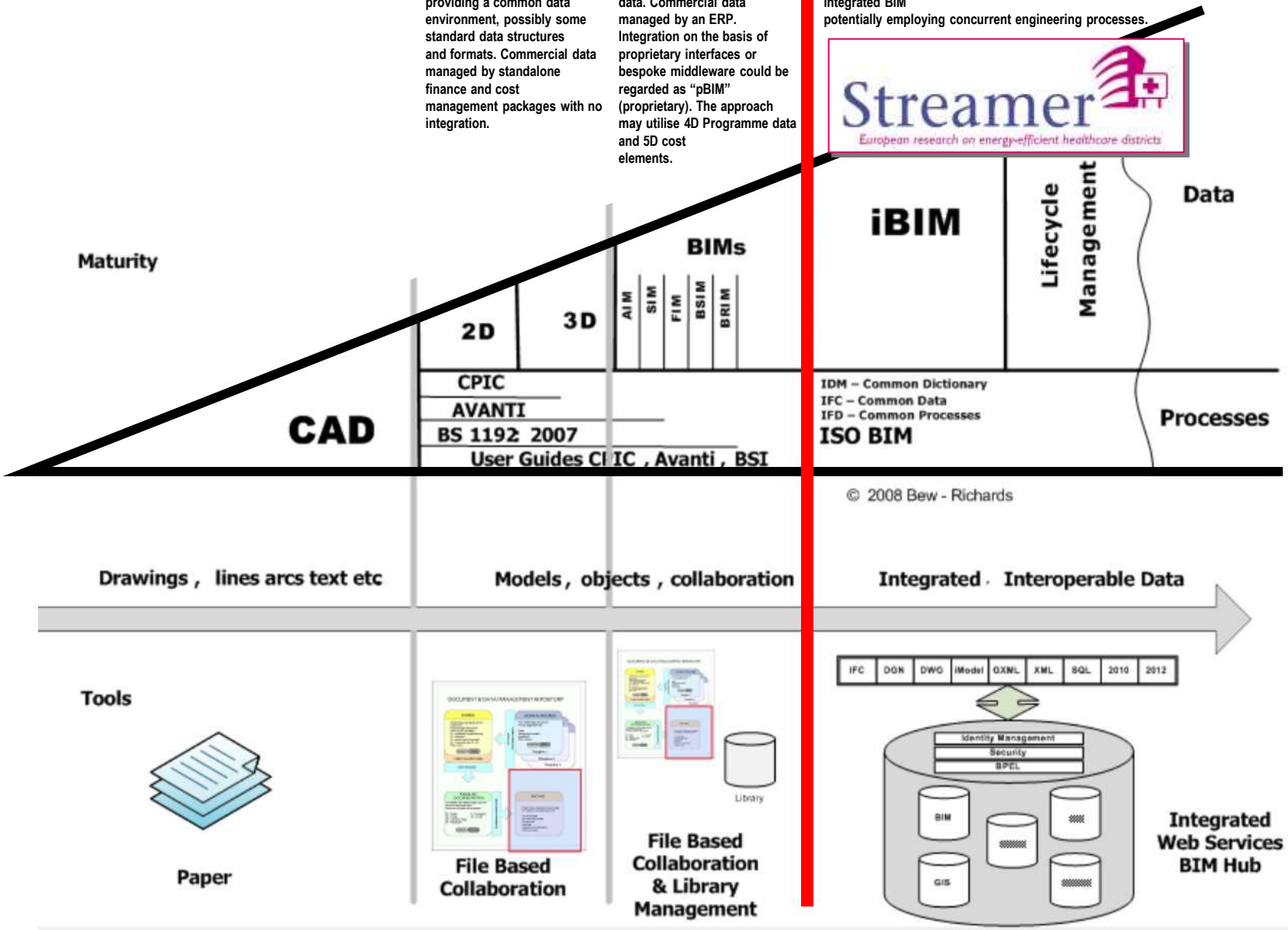



bim
workflow

Workflow design methodology

Workflow design methodology

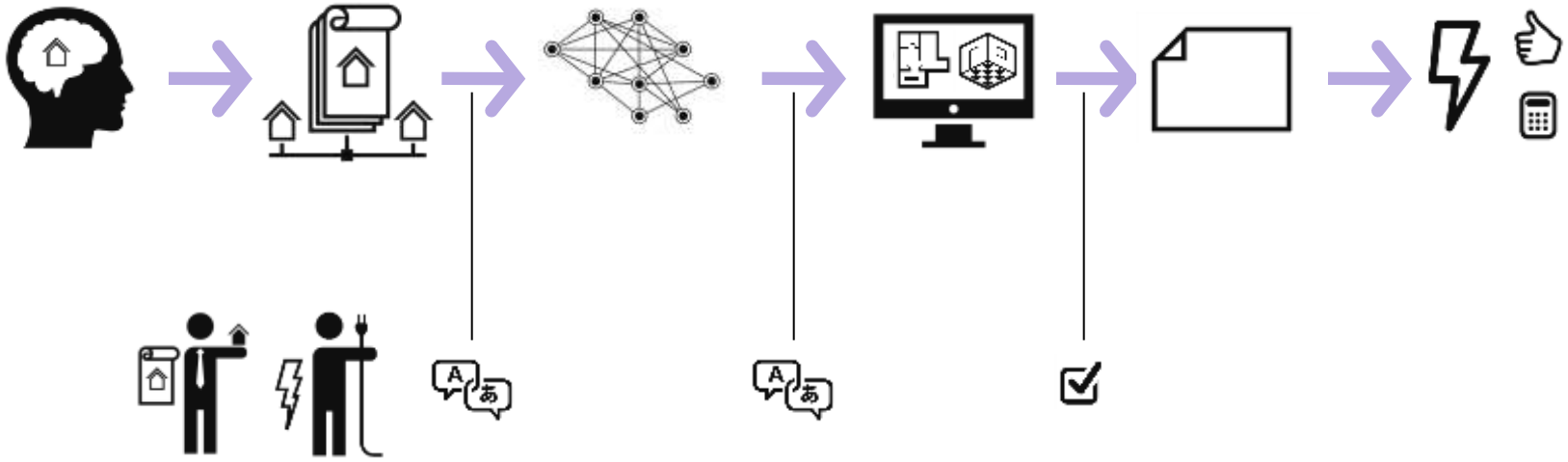
Building

Layer

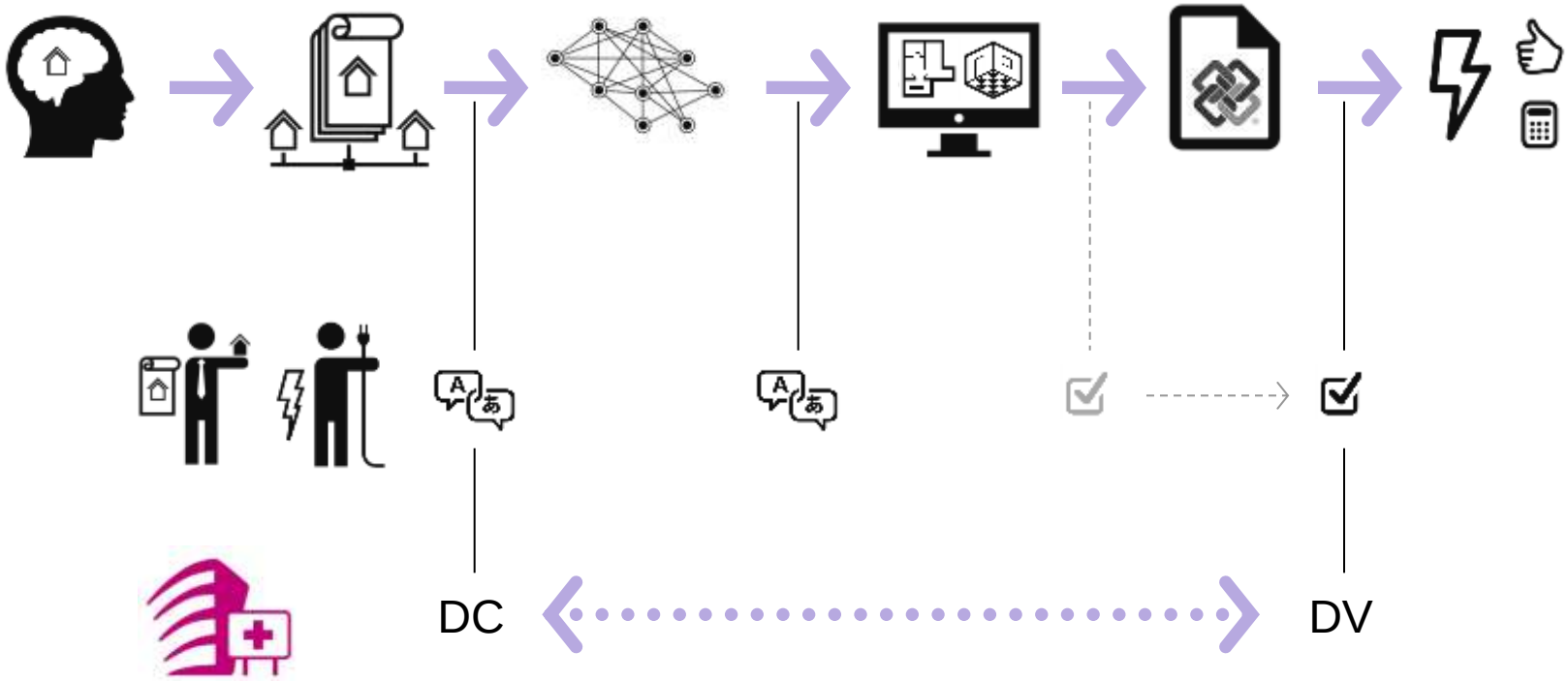
Department

Room

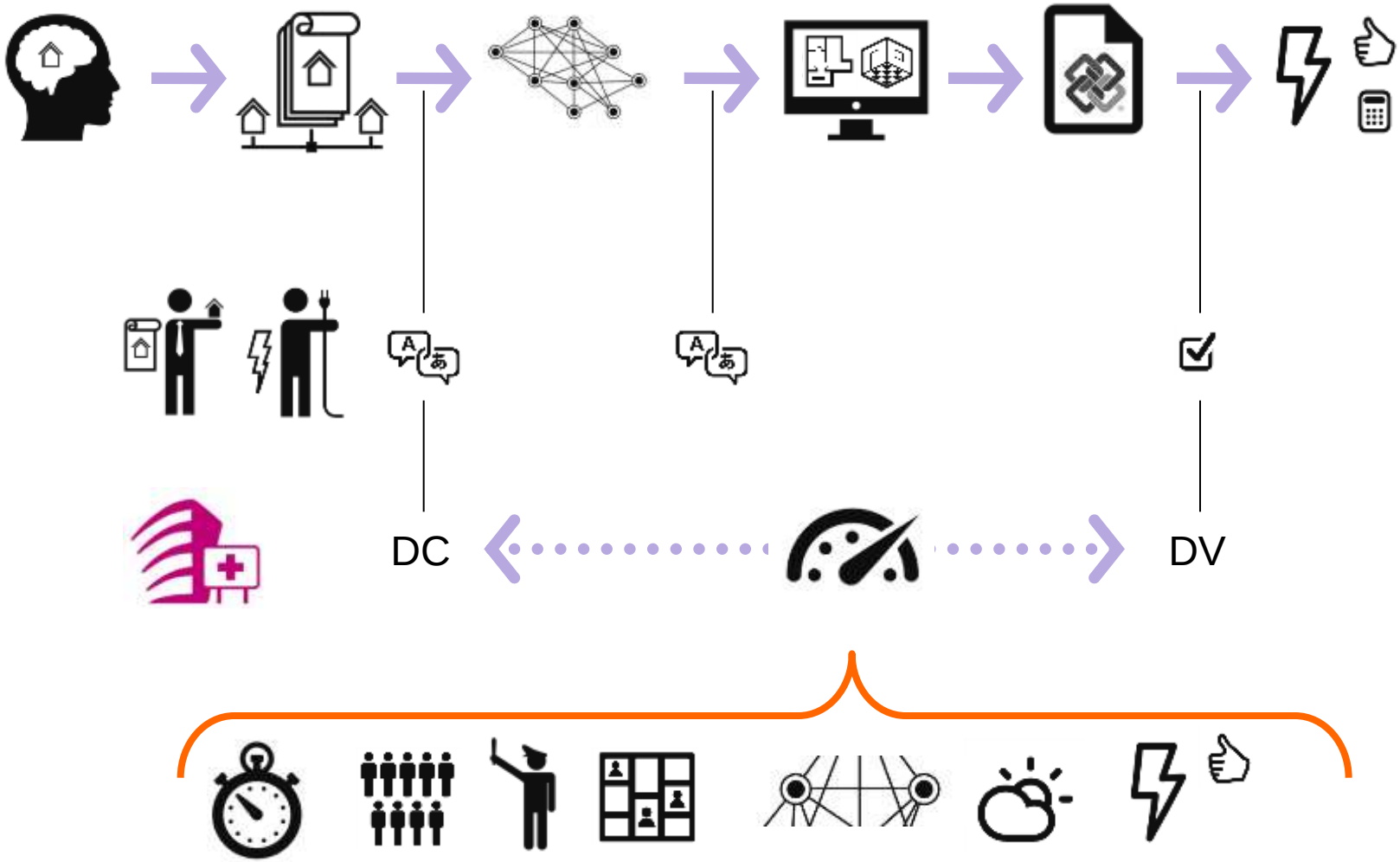
Workflow – with creative translations



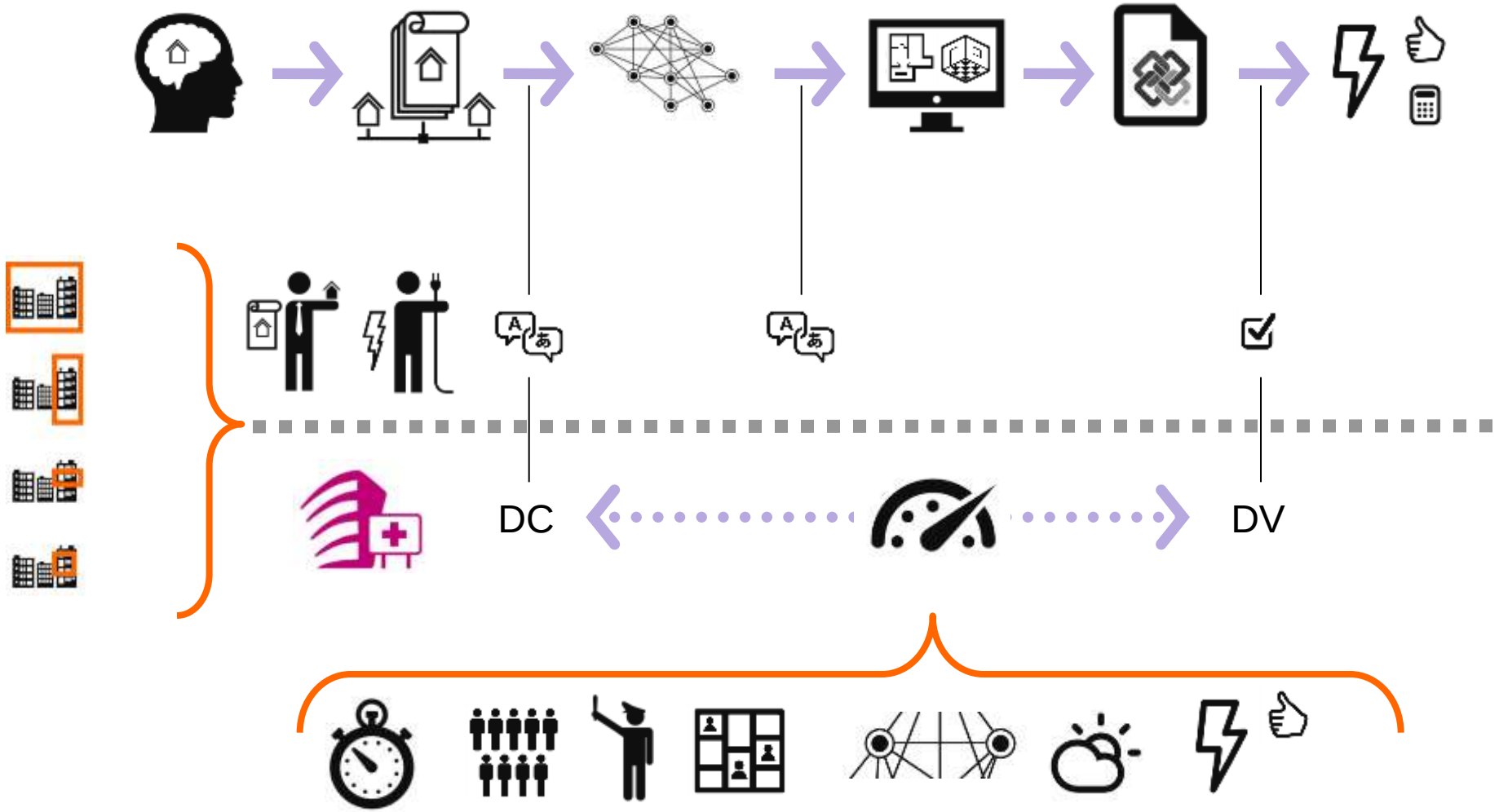
Workflow – creative translations assisted by streamer



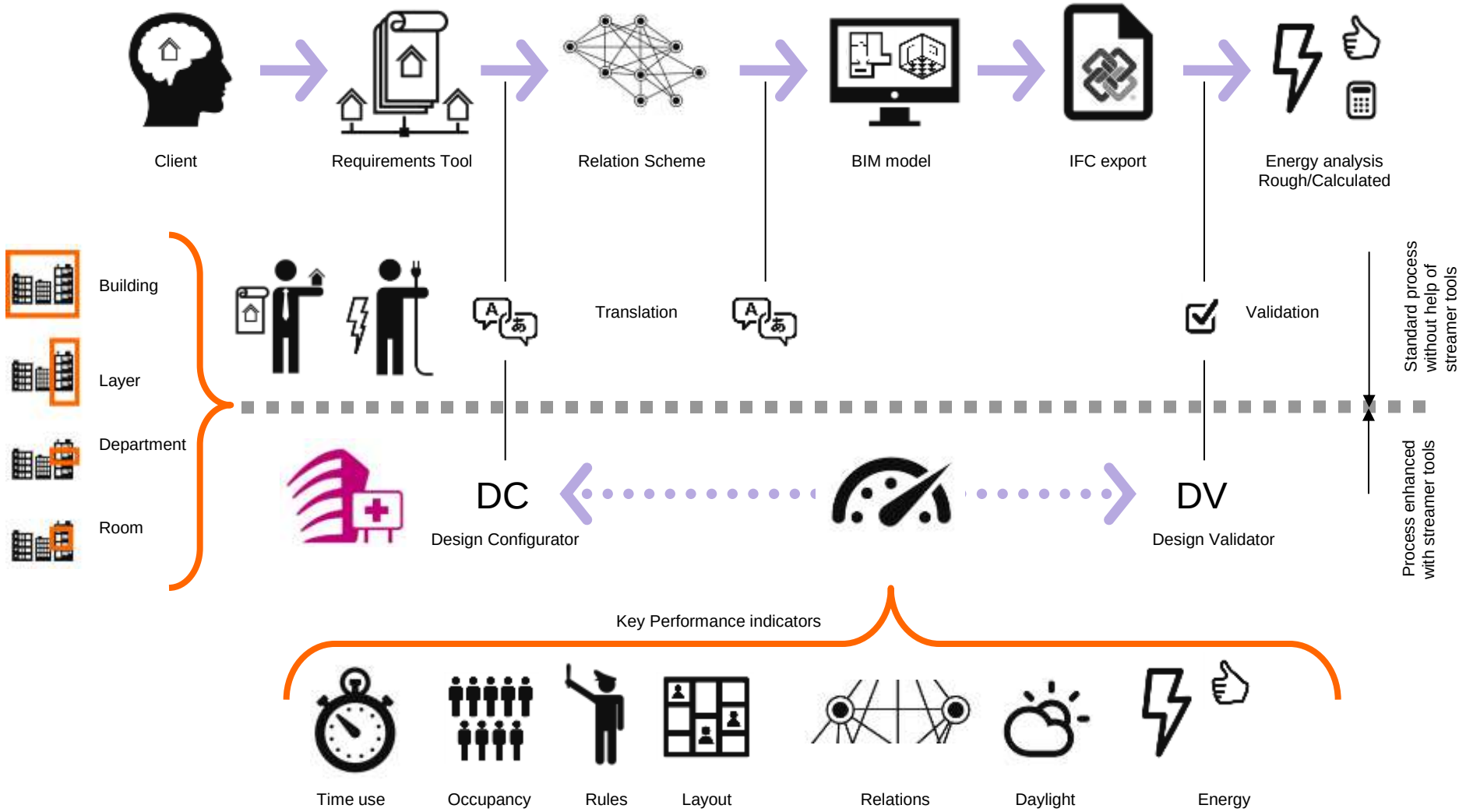
Workflow – streamer tools driven by KPI's



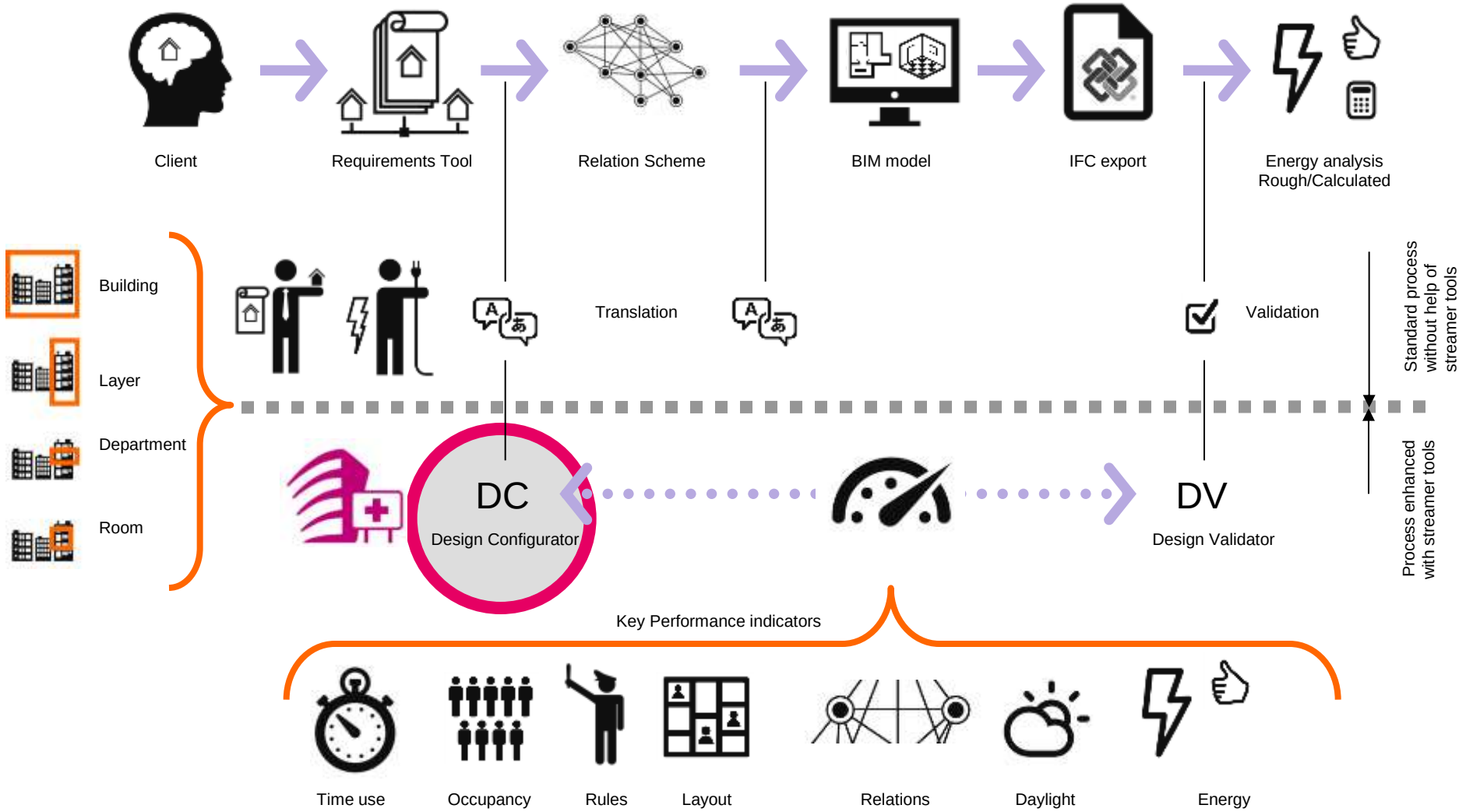
Workflow – tools with KPI's at different scales



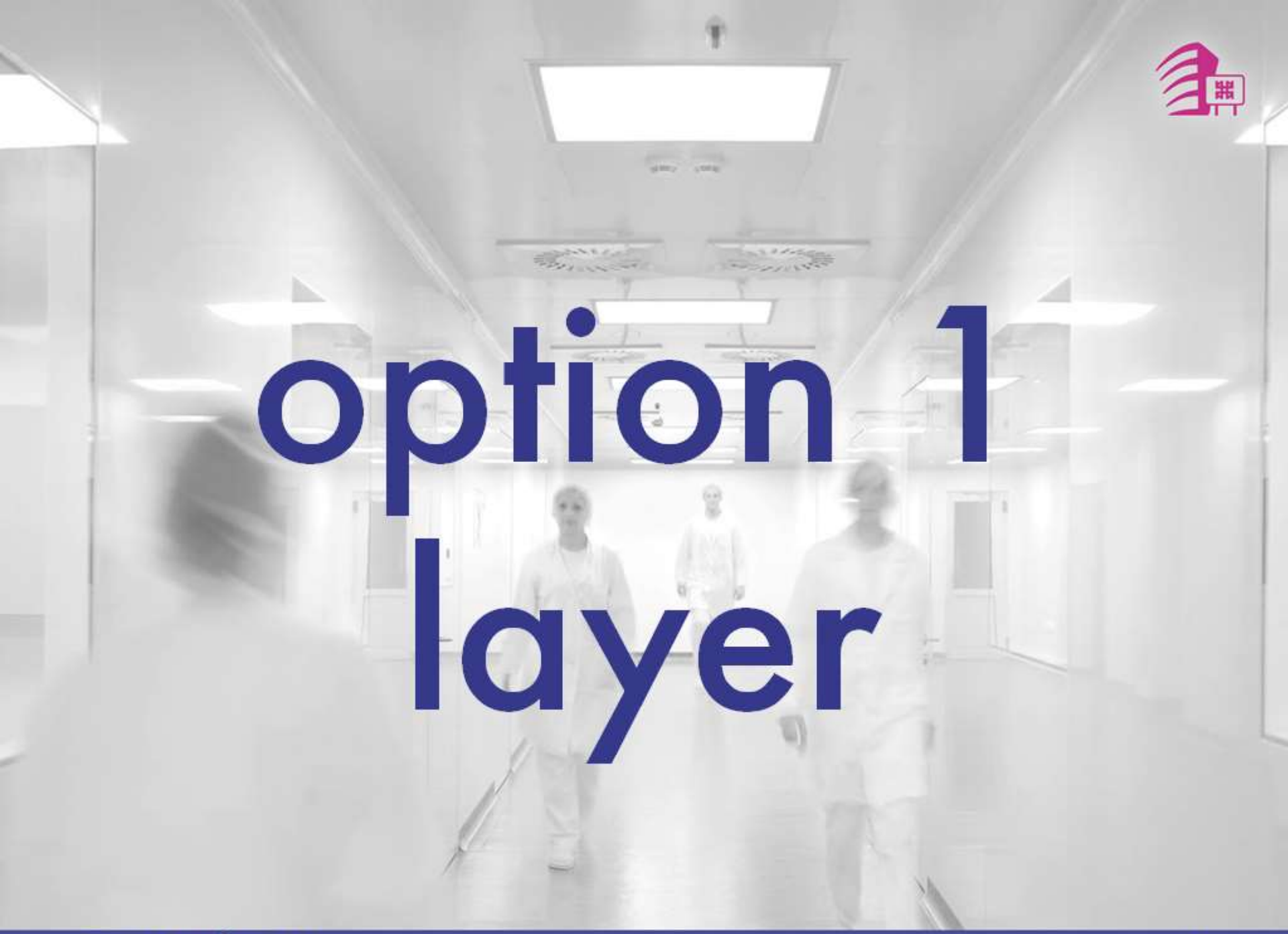
Workflow – tools with KPI's at different scales



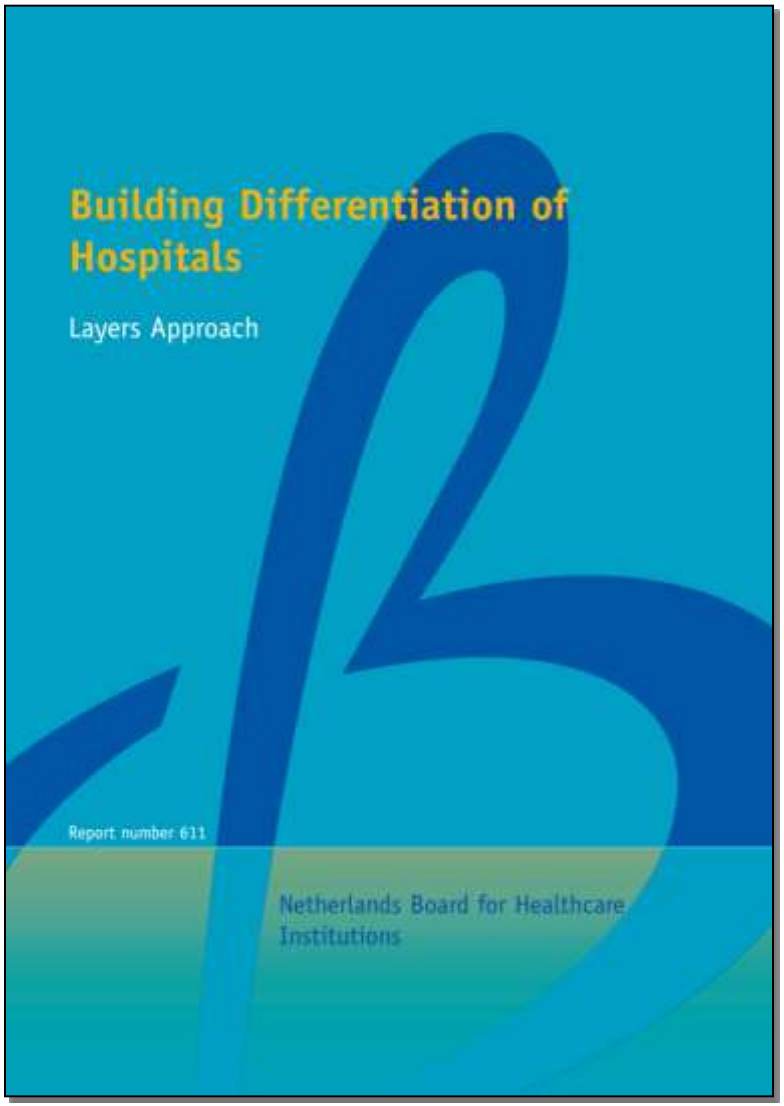
Workflow – tools with KPI's at different scales



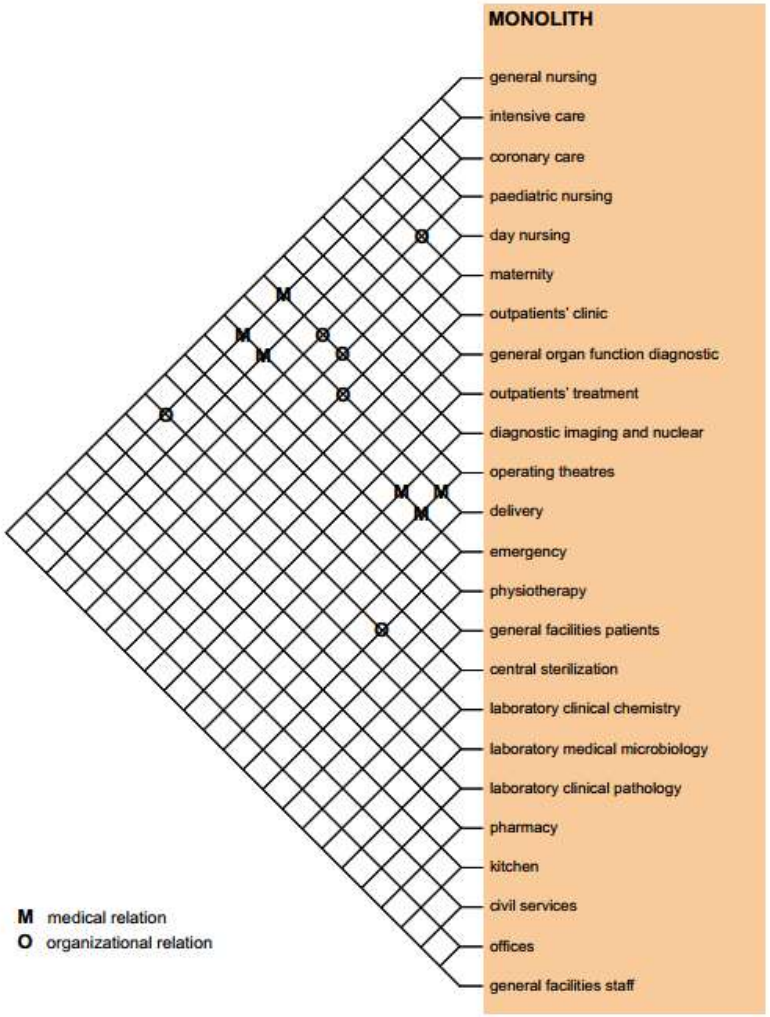

design
configurator


option 1
layer

Layer approach

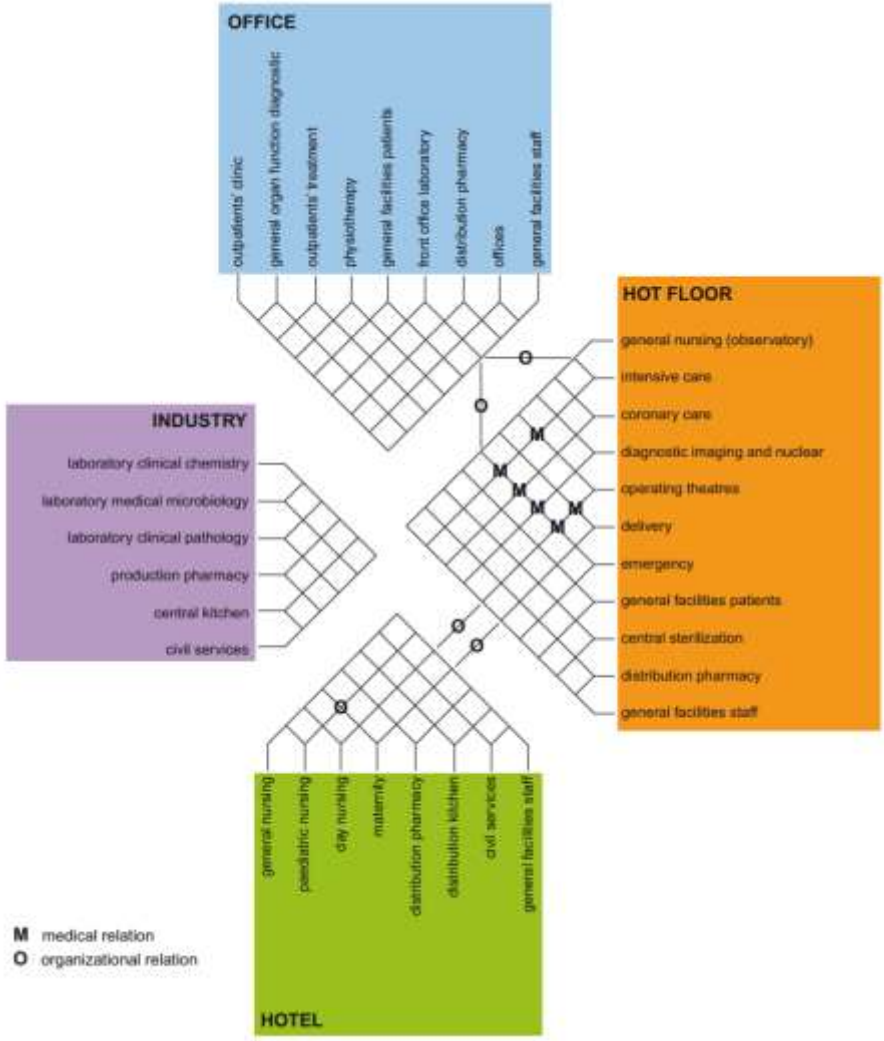


Layer approach



de jong gortemaker algra

Layer approach



de jong gortemaker algra

Layer approach

Hotel

specificity	
costs	
flexibility	
marketability	

Hot floor

specificity	
costs	
flexibility	
marketability	

Office

specificity	
costs	
flexibility	
marketability	

Industry

specificity	
costs	
flexibility	
marketability	

de jong gortemaker algra

Design & Health Award 2014

de jong gortemaker algra

Sint Antonius Hospital

de jong gortemaker algra


de jong gortemaker algra

Deventer hospital

de jong gortemaker algra


de jong gortemaker algra

Maas en Kempen hospital

de jong gortemaker algra

option 2
activity labels

Labelling activities to be attached to BIM

Label	level
Hygienic classes (has a relation with amount of ventilation, air tightness, cleaning, materials)	- H1 (corridor, réception, toilette, , etc.) - H2 (office, bath room, etc.) - H3 (patient room, examination room, treatment room, etc.) - H4 (operating room, insulation room, etc.) -> additional air tightness and ventilation extra ductwork is necessary - H5 (laboratory, production pharmacy, etc.) -> additional air tightness ventilation extra ductwork is necessary
Accessibility (has a relation with the position in the hospital, safety/protective/security device)	- A1 (Public) - A2 (Patients, visitors and staff) - A3 (Patients and staff - A4 (All staff members) - A5 (Specific staff members)
Equipment (has a relation with the type of function, high electric power needed, medical gasses, , ICT data points)	- EQ1 (Office level) - EQ2 (EQ1 and medical gasses) - EQ3 (EQ1 and extra electric power) - EQ4 (EQ1 and extra ICT data points) - EQ5 (EQ2, EQ3 and EQ4) - EQ6 (High electrical safety) - EQ7 (special equipment)
Construction (has a relation with floor strength, shielding against radiation, floor height, air tightness)	- C1 (Office level) - C2 (Office level with extra floor strength) - C3 (Office level with extra floor height) - C4 (C2 and C3) - C5 (Accessible from the outside with heave load) - C6 (Shielding against radiation) - C7 (high level of air tightness)
User profile (has a relation with the type of use)	- U1 (Monday to Friday from 8:00 – 18:00) - U2 (U1 with emergency function outside this timeslot) - U3 (24*7) - U4 (U1 extended till 20:00)

hygienic

accessibility

equipment

construction

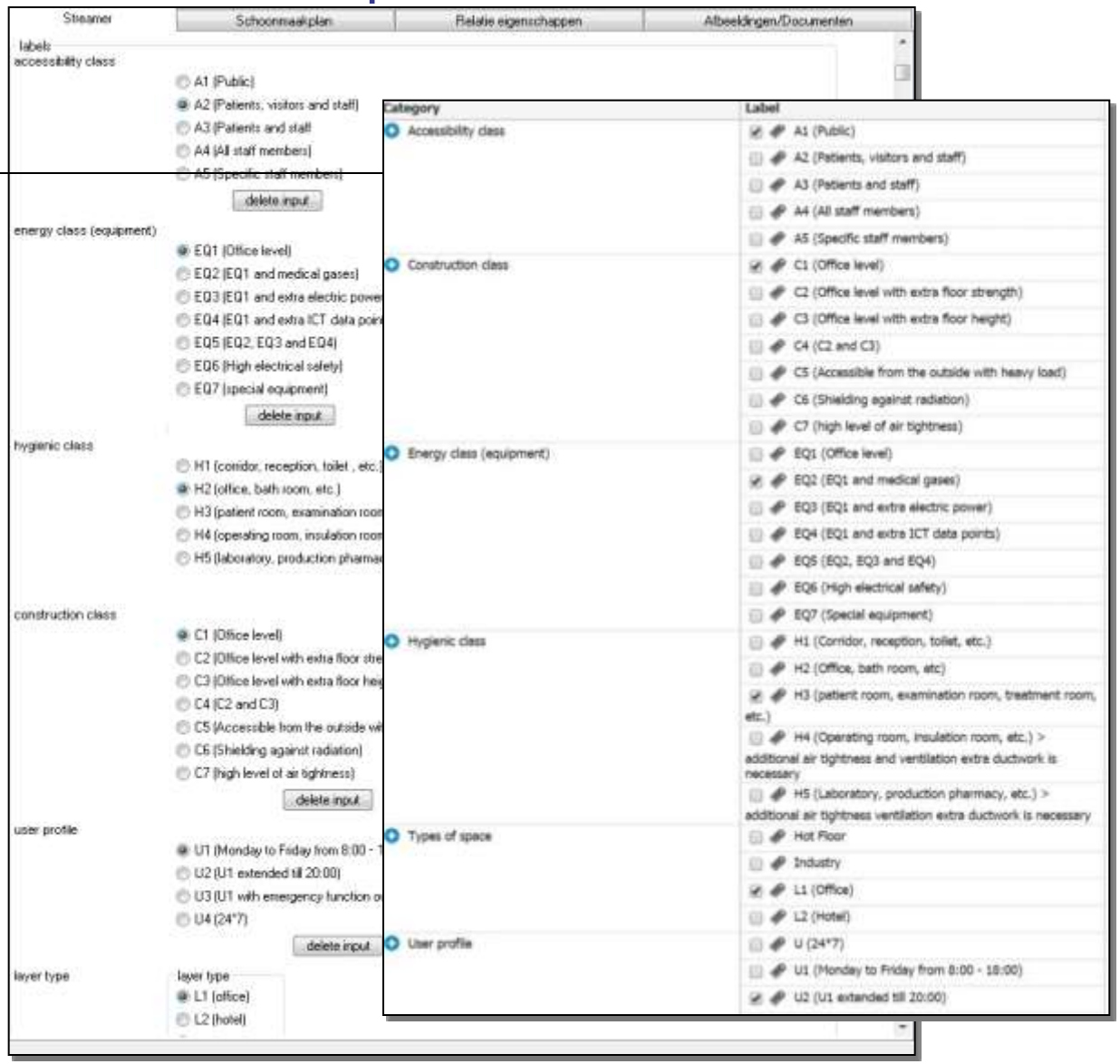
user profile

Labelling activities attached to requirements

BRIEFBUILDER

icop

dRofus



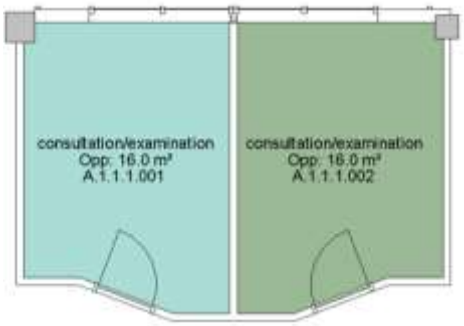
Customised Streamer labels:

- **Accessibility**
- **Energy**
- **Hygiene**
- **Construction**
- **User profile**
- **Layer type**

Parameter visibility helps indentify inconsistencies

Streamer_layer

L1 (office)

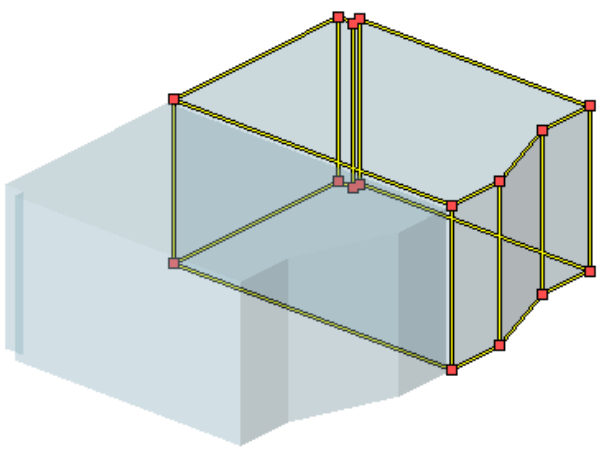


Streamer_user profile

U1 (Monday to Friday from 8:00 – 18:00)

U2 (U1 extended till 20:00)

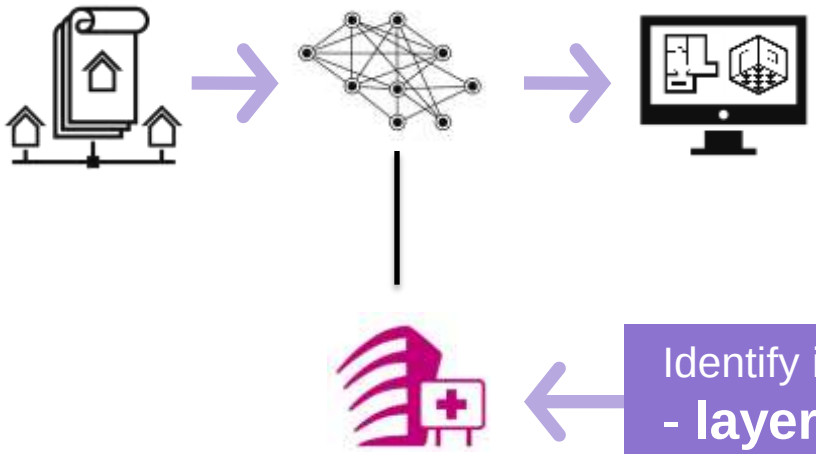
Activity label usability in IFC



FZK VIEWER

User Room Number	
Vloerbelasting door gebruik - Vloer: belasting - kg	0.
Wensen - Daglicht - Daglicht - (Ja/Nee)	TRUE
Wensen - Ruimte afsluitbaar - (Ja/Nee)	FALSE
Wensen - Uitzicht - Uitzicht - (Ja/Nee)	TRUE
Wensen - Zicht op andere ruimte - opm.	
Afdeling - Name	Internal Medicine
Afdeling - Number	1
Bezetting en bedrijfstijden - Aantal FTE - startijd	
Designed - Programmed	0.29
labels - accessibility class - accessibility class	A2 (Patients, visitors and staff)
labels - construction class - construction class	C1 (Office level)
labels - energy class (equipment) - energy class (...	EQ1 (Office level)
labels - hygienic class - hygienic class	H2 (office, bath room, etc.)
labels - layer type - layer type	L1 (office)
labels - user profile - user profile	U1 (Monday to Friday from 8:00 – ...
Program Area	15.7
⊞ Phasing	

Streamer might suggest relation diagrams



Identify inconsistencies at:
- **layer approach,**
- **activity based approach.**

*

LOD is the level of development. These needs to be defined per element subcategory. Per category BIM creators needs to be appointed

Bim coordination by architect

Architect
-structural engineer
-hvac advisor
-interior designer
Create *design model*

LOD*300

design phase

*

LOD is the level of development. These needs to be defined per element subcategory. Per category BIM creators needs to be appointed

Bim coordination by architect

Smart programme of requirements

Design options

Architect
-structural engineer
-hvac advisor
-interior designer
Create *design model*

LOD*300

design phase

*

LOD is the level of development. These needs to be defined per element subcategory. Per category BIM creators needs to be appointed

Bim coordination by architect

Smart programme of requirements

Design options

Architect
-structural engineer
-hvac advisor
-interior designer
Create *design model*

LOD*300

design phase

completion

LOD*500

Contractor
Create *as build model*

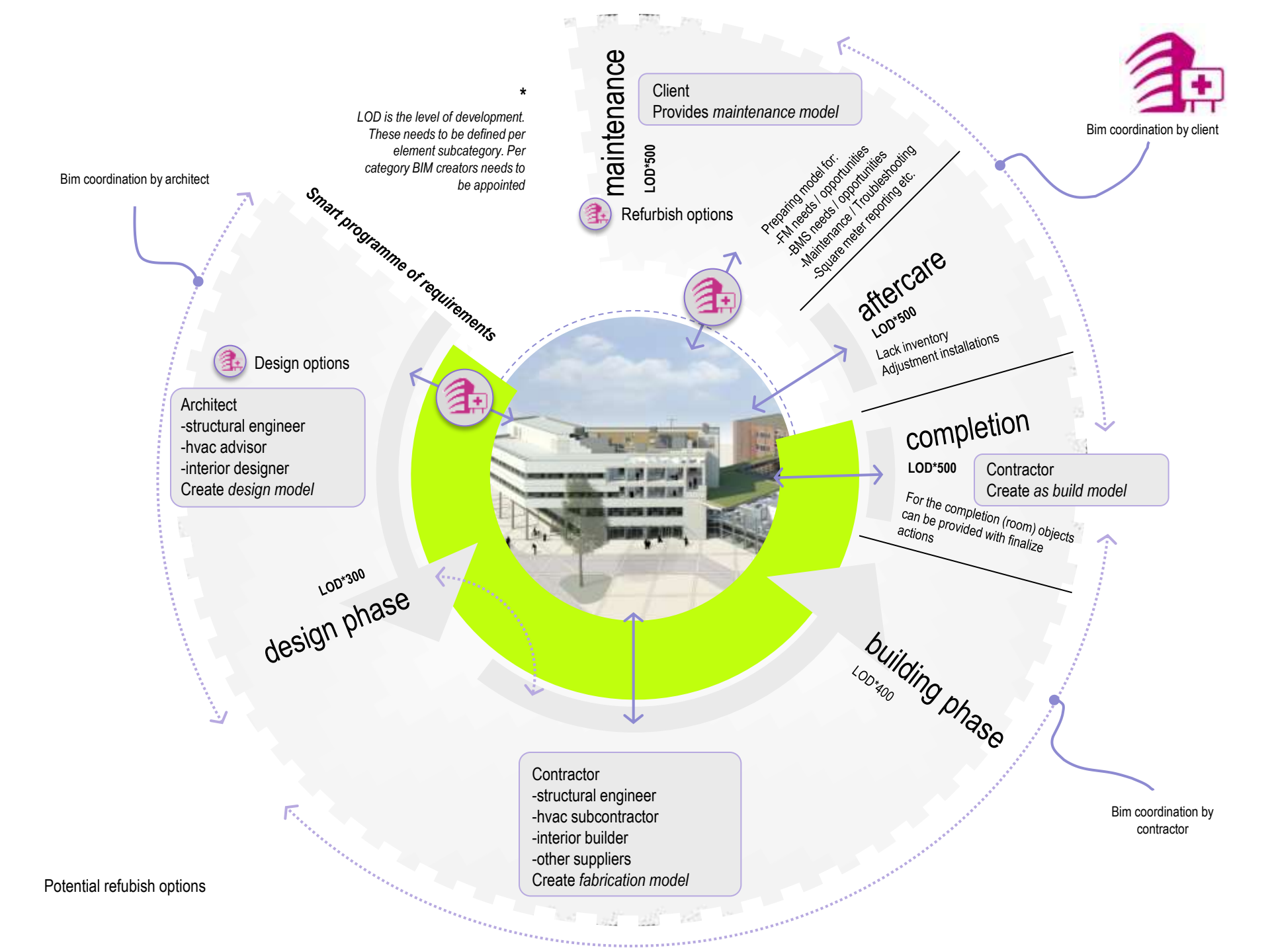
For the completion (room) objects can be provided with finalize actions

building phase

LOD*400

Contractor
-structural engineer
-hvac subcontractor
-interior builder
-other suppliers
Create *fabrication model*

Bim coordination by contractor


*
LOD is the level of development. These needs to be defined per element subcategory. Per category BIM creators needs to be appointed
maintenance
LOD*500
Client
Provides maintenance model
Refurbish options
Bim coordination by client
Bim coordination by architect
Smart programme of requirements
Preparing model for:
-FM needs / opportunities
-BMS needs / opportunities
-Maintenance / Troubleshooting
-Square meter reporting etc.
aftercare
LOD*500
Lack inventory
Adjustment installations
completion
LOD*500
Contractor
Create as build model
For the completion (room) objects can be provided with finalize actions
Design options
Architect
-structural engineer
-hvac advisor
-interior designer
Create design model
LOD*300
design phase
building phase
LOD*400
Contractor
-structural engineer
-hvac subcontractor
-interior builder
-other suppliers
Create fabrication model
Bim coordination by contractor
Potential refubish options

Colophon

PowerPoint: Workflow design methodology
Issue Date: 20141003
Author: Martjan den Hoed – De Jong Gortemaker Algra architects and engeneers www.djga.nl
Version: 1.0

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